COMPAQ

ProLiant 1600 Servers

Supporting Pentium II Processors with 100 MHz GTL Bus
Maintenance and Service Guide

First Edition (May 1998)
Part Number 179480-001
Spares Part Number 313625-001
Compaq Computer Corporation

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About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus.

WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

IMPORTANT: The installation of options and servicing of this product shall be performed by individuals that are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Compaq Technician Notes

WARNING: Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.

CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

CAUTION: The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.

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- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

IMPORTANT: Any indication of repair at the component level or modification of a printed wiring board may void any warranty.

Where to Go for Additional Help

Major sources of additional information are listed below.

Other Information Sources

In addition to this guide, the following information sources are available:

- User Documentation
- *Compaq Service Quick Reference Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- Compaq QuickFind
- Compaq Insight Manager
- Compaq Download Facility: Call 1-281-518-1418

Integrated Management Display

Some Compaq server models include a Compaq Integrated Management Display (IMD), an integrated, 16x4 character display mounted on the front of the server. This display provides easy-to-use menu-driven access to server information, including model number, LCD firmware revision, and POST operations.

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

In the United States, call 1-800-345-1518
In Canada, call 1-800-263-5868

For Compaq technical support:
In the United States and Canada, call 1-800-386-2172
For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq Website at:

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Chapter 1
Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spare parts list for the Compaq ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus. See Table 1-1 for the names of referenced spare parts.

Mechanical Parts Exploded View

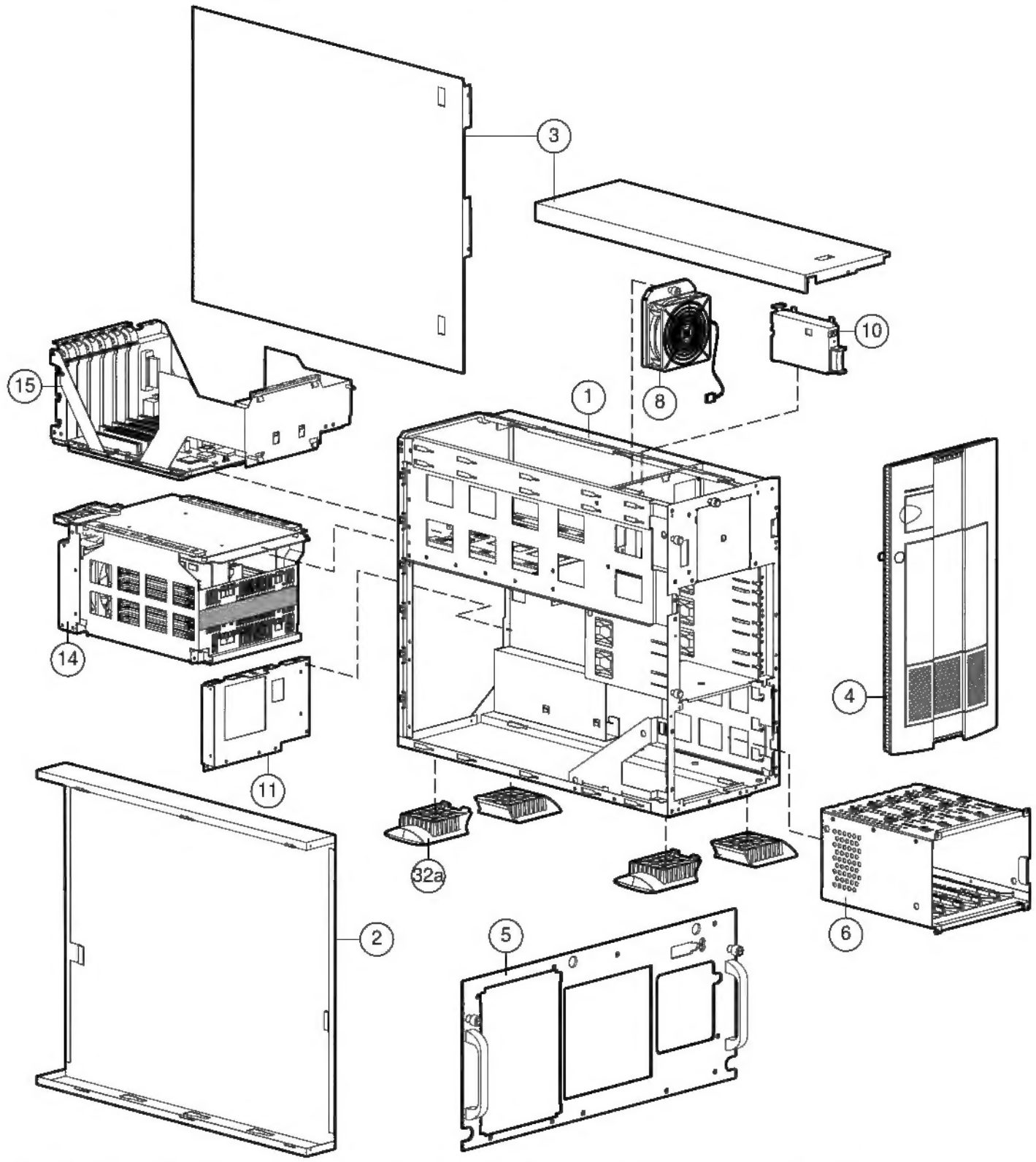

Figure 1-1. Exploded view of the Compaq ProLiant 1600 Server mechanical parts

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System Components Exploded View

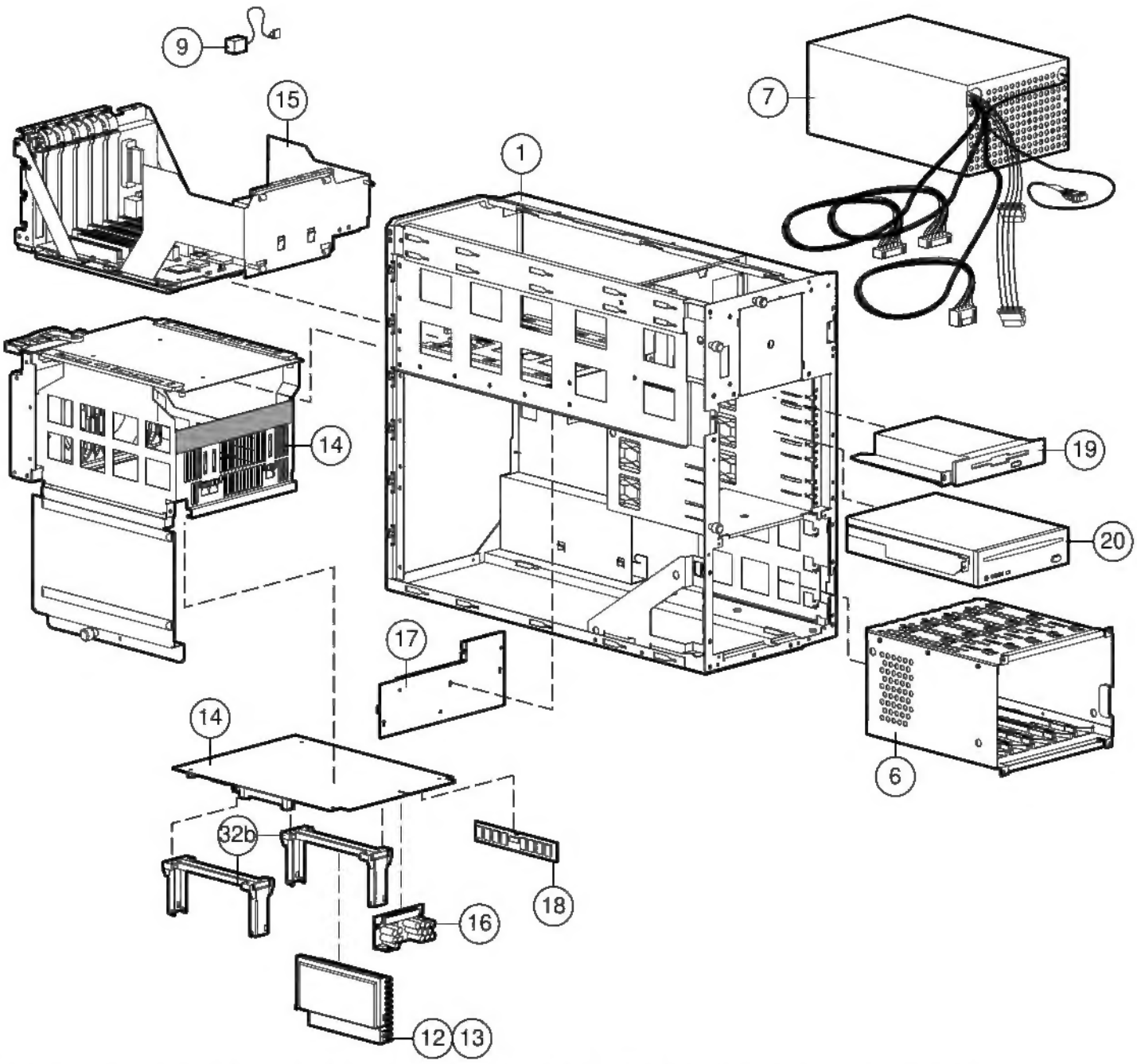

Figure 1-2. Exploded view of the Compaq ProLiant 1600 Server system components

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Spare Parts List

Table 1-1
Spare Parts List

Ref	Description	Spare Part #
CHASSIS		
1	Chassis	313641-001
2	Right Side Access Panel	271927-001
3	Left Side Access Panel and Top Cover	333563-001
4	Front Bezel	298012-001
5	Front Bezel Plate (rack-mountable model only)	271924-001
6	Hot-Plug Drive Cage, (5 x 1.0-inch)	250911-001
SYSTEM COMPONENTS		
7	Power Supply, 325W	271916-001
8	I/O Fan with Bracket	281844-001
9	4.5 V Battery Replacement	160274-001
10	Power Switch and Bracket	271929-001
11	Power Supply Rear Panel	270265-001
	BOARDS	
12	Processor, with Heat Sink 350/100	313623-001
13	Processor, with Heat Sink 400/100	313624-001
14	Processor Board, Dual SCSI, with Cage and Fan	313622-001
15	System I/O Board, (PCI/ISA), with cage	313621-001
16	Processor Power Module	327660-001
17	Backplane Board, PCI, Dual SCSI	149046-001
	MEMORY	
18	64-MB DIMM (SDRAM, Reg 100 MHz)	317745-001
	MASS STORAGE DEVICES	
19	1.44 MB Diskette Drive	172465-001
20	IDE 24X CD-ROM Drive	278026-001
	CABLES	
21	Diskette Cable	271928-001 *
22	Point to Point SCSI Cable	149097-001 *
23	IDE/CD Cable	271936-002 *

Continued

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Spare Parts List *Continued*

24	SCSI DAT/DLT Cable	300926-001 *
25	Parallel Cable	271938-001 *
26	SCSI Adapter Kit 50-to-68, Female	189638-001 *
	MISCELLANEOUS	
27	Return Kit	298017-001 *
28	Carton and Buns (International)	298017-002 *
29	Maintenance and Service Guide	313625-001 *
30	Illustrated Parts Map	313626-001 *
31	Slide Rail, 22-inch, Pair	165689-002 *
32	Miscellaneous Plastics Kit a) feet b) processor retention brackets	333575-001
33	Country Kit	313648-001 *
OPTIONS		
34	32-MB DIMM (SDRAM, Reg 100 MHz)	317747-001 *
35	128-MB DIMM (SDRAM, Reg 100 MHz)	317756-001 *
36	256-MB DIMM (SDRAM, Reg 100 MHz)	317749-001 *
37	Duplexed Hot-Plug Drive Cage, 4 x 1.0-inch	271932-001 *
38	Hot Plug Drive Cage, 3 x 1.6"	250909-001 *
39	Rack Conversion Kit	333574-001 *
40	Integrated Management Display	271930-001 *
41	9.1-GB Non-Pluggable Wide Ultra 1.6-inch Hard Drive	199886-001 *
42	9.1-GB Pluggable Wide Ultra 1.6-inch Hard Drive	199888-001 *
43	9.1-GB Non-Pluggable Fast-SCSI-2 Hard Drive	199885-001 *
44	4.3-GB Pluggable Wide Ultra 1-inch Hard Drive	242622-001 *
45	4.3-GB Non-Pluggable Wide Ultra 1-inch Hard Drive	242606-001 *
46	4.3-GB Pluggable Fast-Wide SCSI-2 Hard Drive	199598-001 *
47	4.3-GB Non-Pluggable Fast-Wide SCSI-2 Hard Drive	199599-001 *
48	4.3-GB Pluggable Fast-SCSI-2 Hard Drive	199584-001 *
49	4.3-GB Non-Pluggable Fast-SCSI-2 Hard Drive	199585-001 *

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Spare Parts List *Continued*

50	2.1-GB Pluggable Wide Ultra 1-inch Hard Drive	242603-001 *
51	2.1-GB Non-Pluggable Wide Ultra 1-inch Hard Drive	242604-001 *
52	2.1-GB Pluggable Fast-Wide SCSI-2 1-inch Hard Drive	199878-001 *
53	2.1-GB Pluggable Fast-Wide SCSI-2 Hard Drive	199643-001 *
54	2.1-GB Non-Pluggable Fast-Wide SCSI-2 Hard Drive	199644-001 *
55	2.1-GB Pluggable Fast-Wide SCSI-2 Hard Drive	199428-001 *
56	2.1-GB Non-Pluggable Fast-SCSI-2 Hard Drive	142272-001 *
57	1.05-GB Pluggable Fast-SCSI-2 Hard Drive	146717-001 *
58	1.05-GB Non-Pluggable Fast-SCSI-2 Hard Drive	146799-001 *
59	1-inch Drive Tray, Fast-Wide Connector	199880-001 *
60	1-inch Drive Tray, Fast-SCSI-2 Connector	242593-001 *
61	1.6-inch Drive Tray, Fast-SCSI-2 Connector	199656-001 *

* Not Shown

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Chapter 2
Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus. After completing all necessary removal and replacement procedures, run the Diagnostics program to verify that all components operate properly.

To service Compaq ProLiant 1600 Servers, you might need the following:

- Torx T-15 screwdriver
- From the Compaq SmartStart and Support Software CD:
  - System Configuration Utility software
  - Drive Array Advanced Diagnostics software
  - Diagnostics software

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover work stations with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Keep work area free of non-conductive materials such as ordinary plastic assembly aids and foam packing.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives PCB assembly side down.
- Use conductive field service tools.

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Symbols in Equipment

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce the risk of injury from a hot component, allow the surface to cool before touching.

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator serviceable parts. To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

WARNING: Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

WARNING: This label or equivalent is located on the surface of your CD-ROM drive. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Preparation Procedures

Before beginning any of the removal and replacement procedures for non-hot-pluggable devices:

1. Turn off the server.
2. Disconnect the AC power cord from the AC outlet, then from the server.
3. Disconnect all external peripheral devices from the server.
4. For some removal and replacement procedures, you must remove the server from the rack and place it on a sturdy table or workbench. Refer to *ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus Setup and Installation Guide* for instructions.

WARNING: Because the rack allows you to stack computer components on a vertical rather than horizontal plane, you must take precautions to provide for rack stability and safety. It is important that you follow these precautions to provide for rack stability and safety, and to protect both personnel and property. Heed all cautions and warnings throughout the installation instructions that came with the server.

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CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. See the section titled "Electrostatic Discharge Information" in this chapter, for more information.

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Rack Warnings

WARNING: To reduce the risk of personal injury, make sure that the rack is adequately stabilized before extending a component outside the rack. A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizers are attached to the rack if it is a single rack installation.
- The racks are coupled together in multiple rack installations.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Install the power supply before connecting the power cord to the power supply.
- Unplug the power cord before removing the power supply from the server.
- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.

CAUTION: The Compaq ProLiant 1600 server must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

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Server Warnings and Precautions

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Disconnect power from the server by unplugging the power cord from either the electrical outlet or the server.

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

CAUTION: The ProLiant 1600 servers must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

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Front Bezel

To remove the front bezel:

1. Unlock the front bezel keylock.
2. Open the front bezel.
3. Lift up the front bezel and pull it away from the chassis.

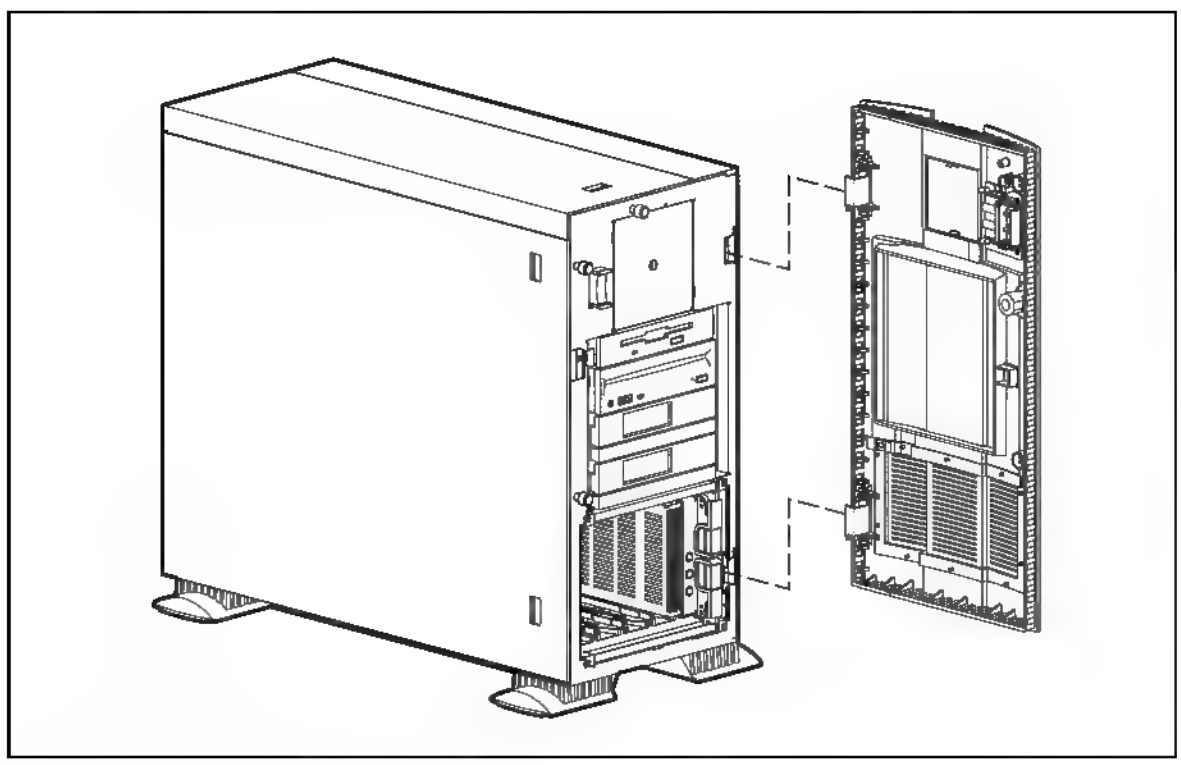

Figure 2-1. Removing the front bezel

Reverse steps 1 through 3 to replace the front bezel.

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Front Bezel Plate

To remove the front bezel plate :

NOTE: This procedure applies to the ProLiant 1600 rack-mountable model only.

1. Remove the ten T-15 screws from the front bezel plate.
2. Remove the front bezel plate.

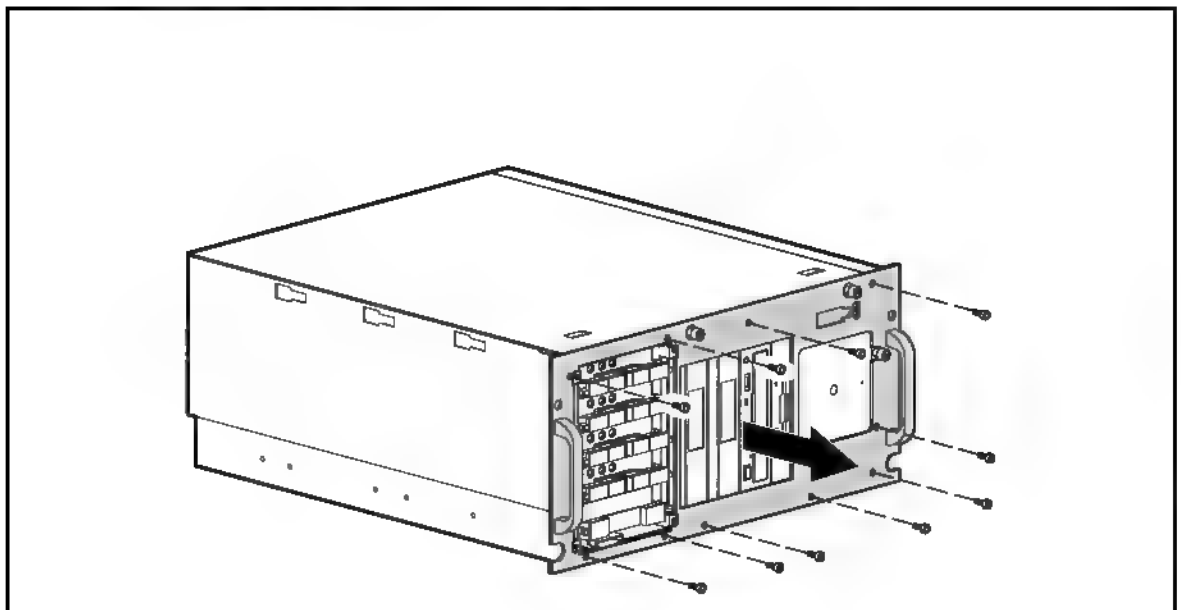

Figure 2-2. Removing the front bezel plate

Reverse steps 1 through 2 to replace the front bezel.

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Feet

To remove the feet from the chassis, one at a time:

1. Perform the preparation procedures. See page 2-2.
2. Remove the front bezel. See page 2-6.
3. Place the server on its left side.
4. Remove the T-15 screw from each foot 1.
5. Pivot each foot down 2, and pull it off the base of the chassis 3.

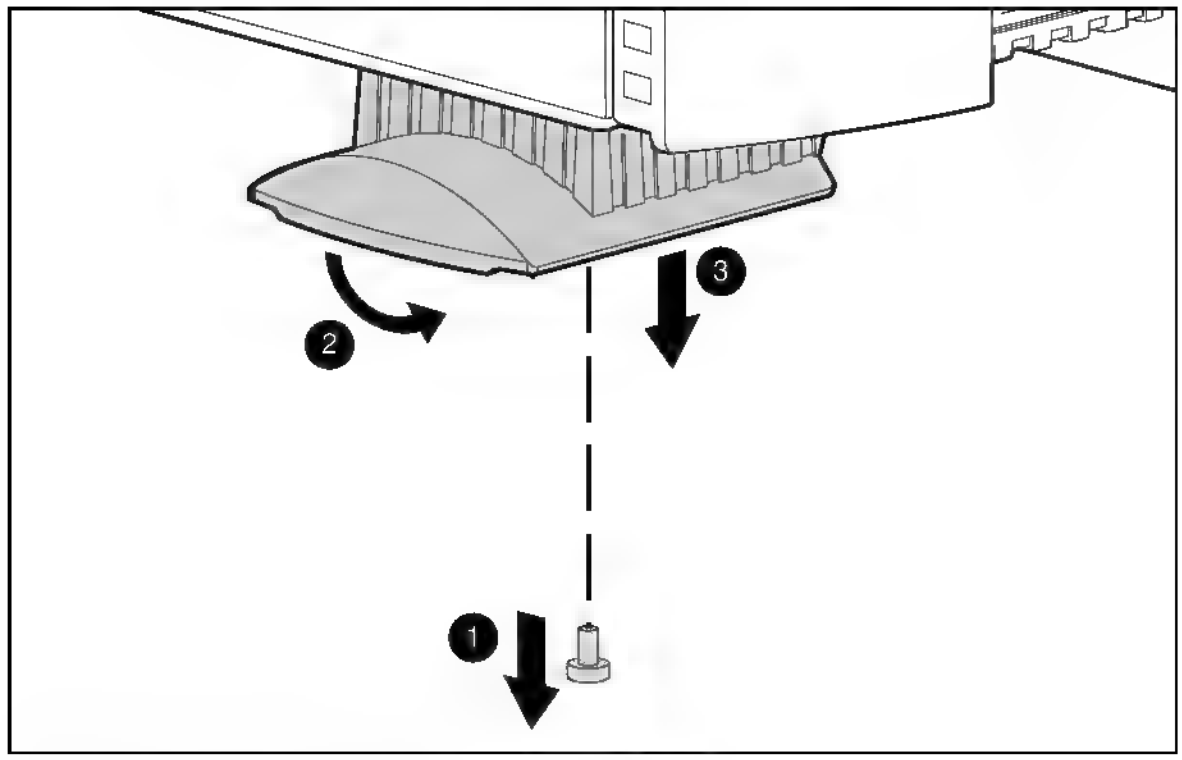

Figure 2-3. Removing the feet from the chassis

Reverse steps 1 through 5 to replace the feet. Make sure each foot snaps securely in its position.

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Left Side Access Panel

Remove the left side access panel to service the hot-plug drive cage, IDE 24X CD-ROM drive, power supply, and backplane board. To remove the left side access panel:

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

1. Perform the preparation procedures. See page 2-2.
2. Open the front bezel.
3. Loosen the two thumbscrews attaching the left side access panel to the front of the chassis.
4. Slide the left side access panel back and pull it away from the chassis.

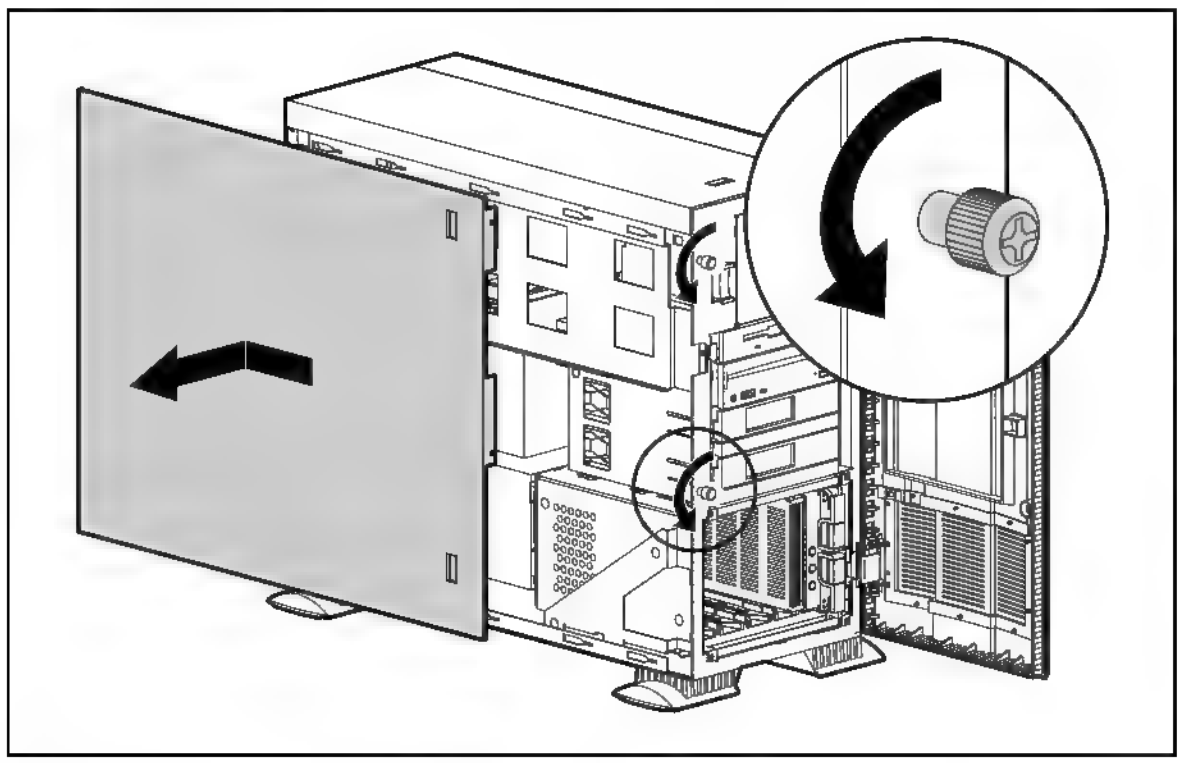

Figure 2-4. Removing the left side access panel

Reverse steps 1 through 4 to replace the left side access panel.

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Top Cover

Remove the top cover to service the PCI and ISA boards, system switches, IDE CD-ROM drive cables, diskette drive cables, I/O fan with bracket, and the power switch.

> **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

To remove the top cover:

1. Perform the preparation procedures. See page 2-2.
2. Open the front bezel.
3. Loosen the thumbscrew attaching the top cover to the chassis 1.
4. Slide the top cover back and out 2.
5. Lift the top cover from the chassis.

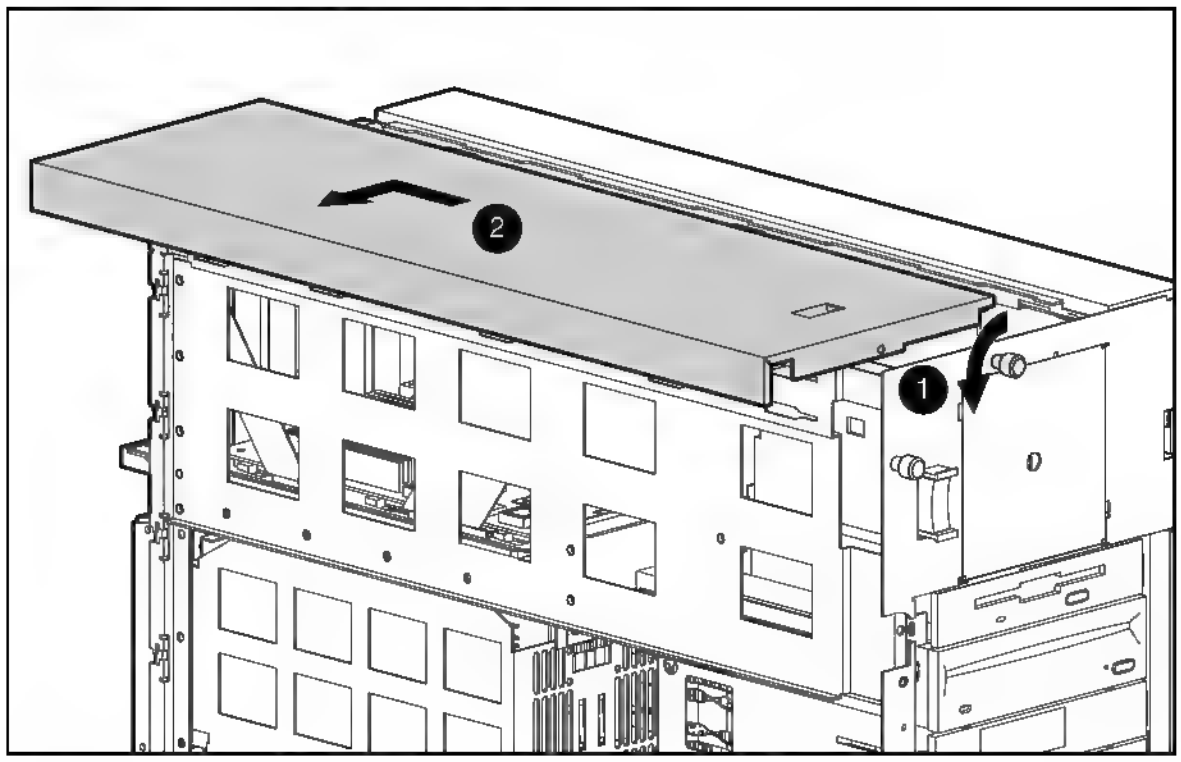

Figure 2-5. Removing the top cover

Reverse steps 1 through 5 to replace the top cover.

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Right Side Access Panel

Remove the right side access panel to convert from tower to rack or to replace a damaged panel. To remove the right side access panel:

1. Perform the preparation procedures. See page 2-2.
2. Remove the front bezel. See page 2-6.
3. Remove the feet on the base of the right side access panel (tower model). See page 2-8.
4. Remove the two T-15 screws securing the right side access panel to the front of the chassis.
5. Pull the right side access panel back and away from the chassis.

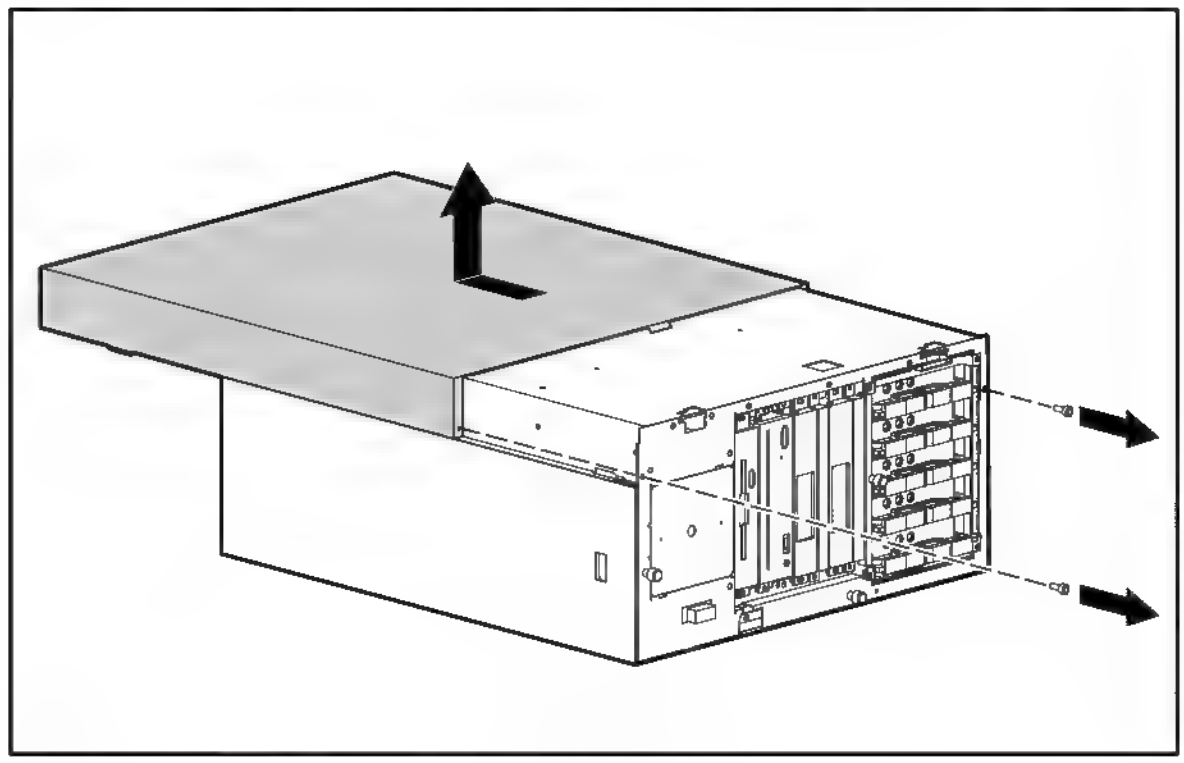

Figure 2-6. Removing the right side access panel

Reverse steps 1 through 5 to replace the right side access panel.

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Mass Storage

Compaq ProLiant 1600 servers ship standard with a hot-pluggable drive cage containing five 1-inch hot-pluggable drive bays. Four removable media bays contain one-third height diskette drive and one-half-height IDE CD-ROM drive. Two bays can contain a second CD-ROM drive, tape drives, hard drives, or any SCSI device.

The Compaq ProLiant 1600 servers support up to seven mass storage devices. The following table and illustration describe the drive configurations.

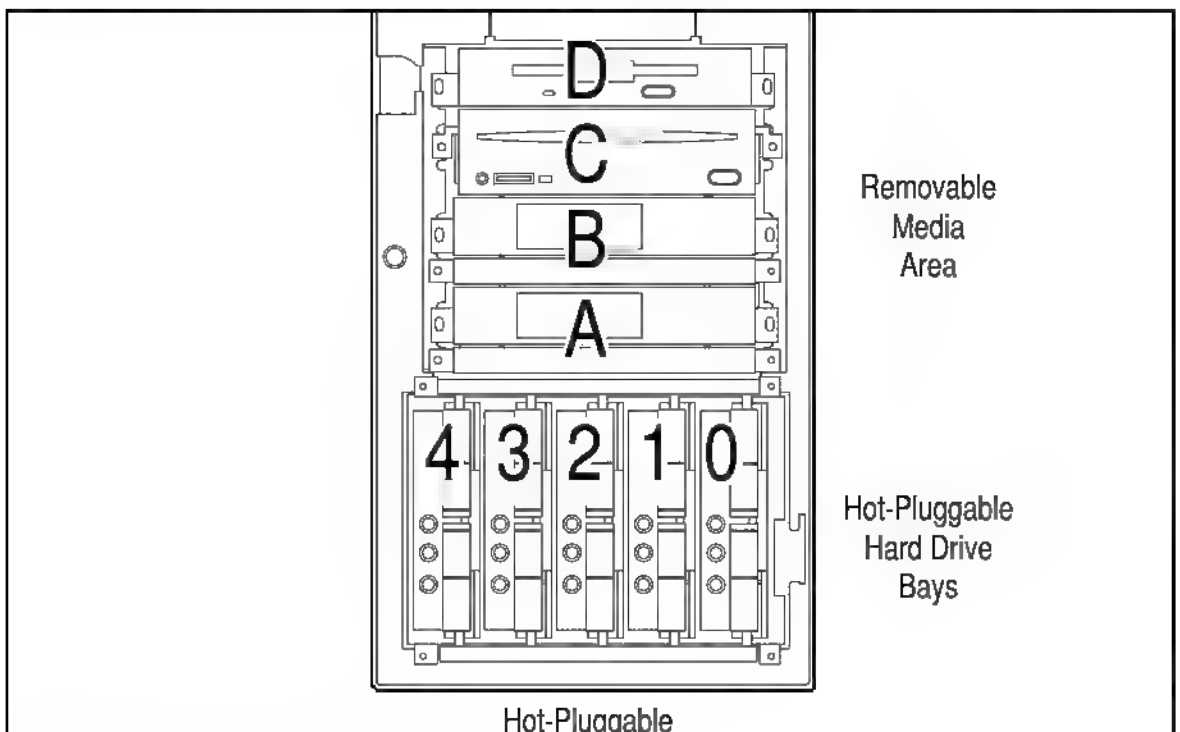

Figure 2-7. Server drive positions

Table 2-1
Description of Drive Bays

Drive Position	Configuration
0-4	Hot-Pluggable Drive Bay
A-B	Media Slot
C	IDE 24X CD-ROM Drive
D	1.44 MB Diskette Drive

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Hot-Plug Drive Cage

To remove the hot-plug drive cage:

1. Perform the preparation procedures. See page 2-2.
2. Remove the front bezel. See page 2-6.
3. Remove the left side access panel. See page 2-9.
4. Disconnect all cables from the hot-plug drive cage.
5. Remove the four T-15 screws.
6. Slide the hot-plug drive cage out the front of the chassis.

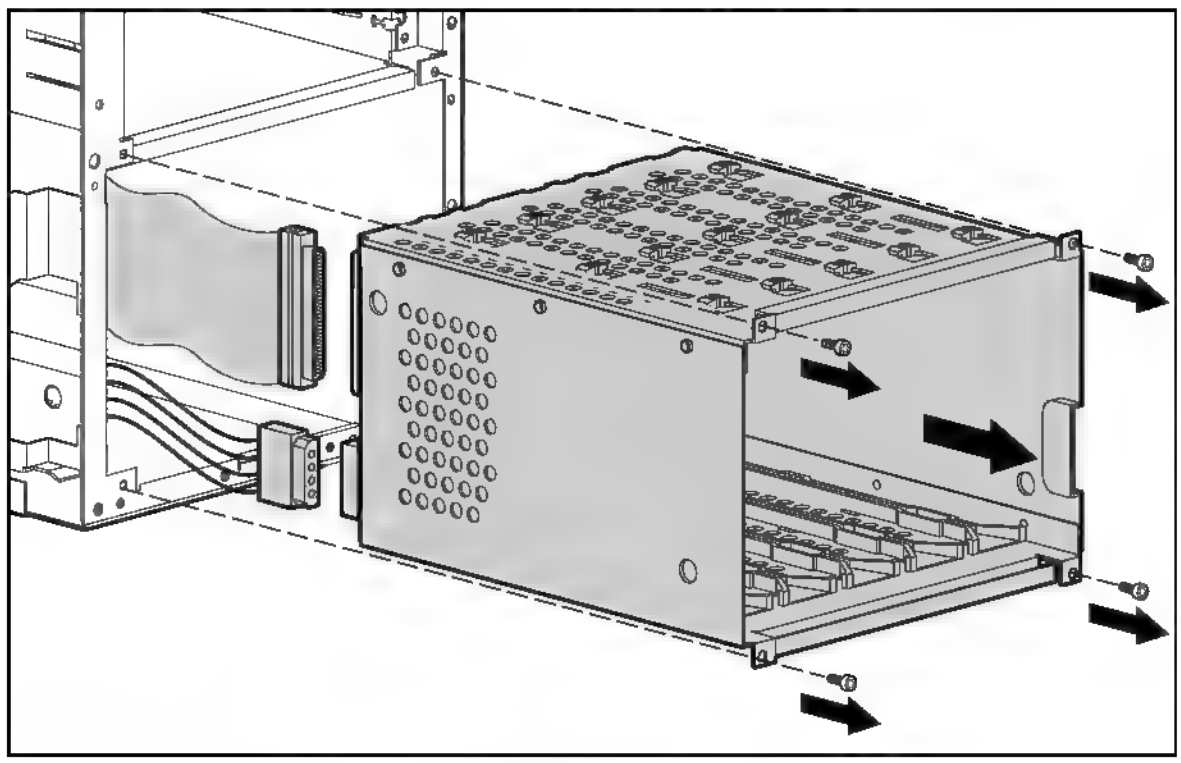

Figure 2-8. Removing the hot-plug drive cage

CAUTION: Make sure that all power and signal cables to the hot-plug drive cage have been reseated properly.

Reverse steps 1 through 6 to replace the hot-plug drive cage.

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IDE 24X CD-ROM Drive

To remove the IDE 24X CD-ROM drive:

1. Perform the preparation procedures. See page 2-2.
2. Open the front bezel.
3. Remove the left side access panel. See page 2-9.
4. Remove the two T-15 screws and washers from the front of the drive.
5. Disconnect the CD-ROM signal cable.
6. Slide the CD-ROM drive out the front of the chassis.
7. Disconnect the power cable.

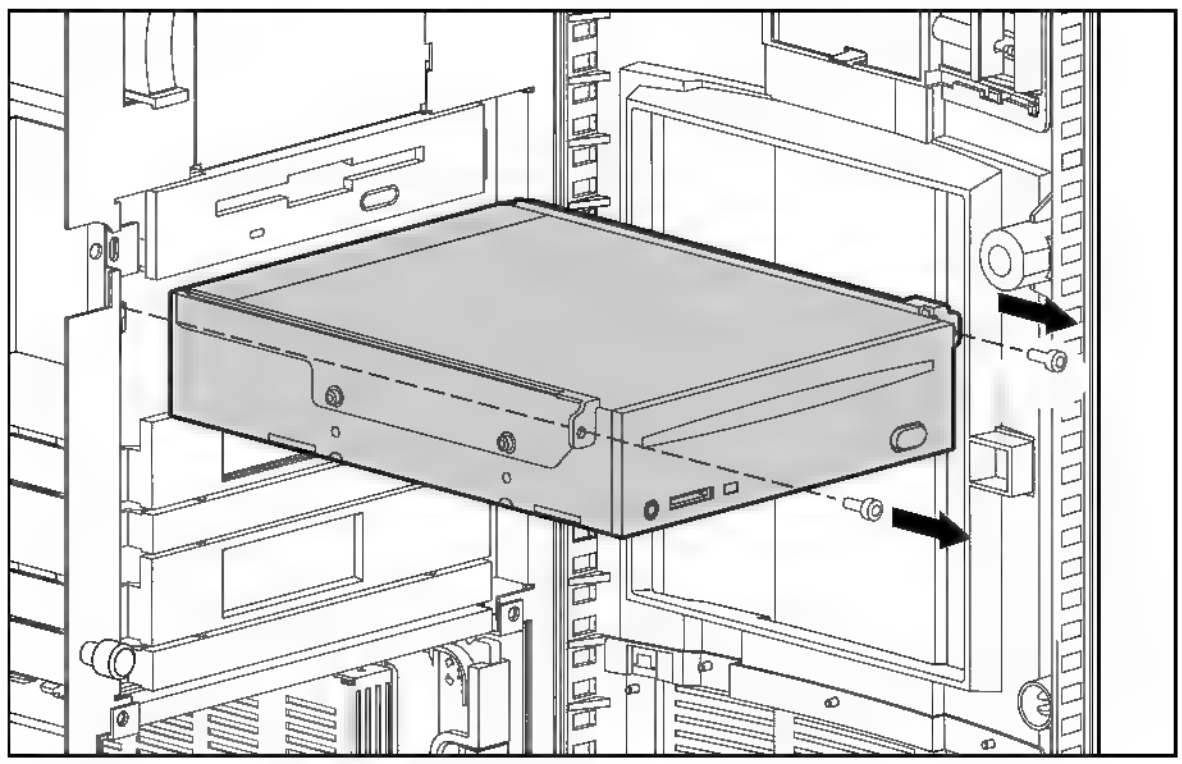

Figure 2-9. Removing the CD-ROM drive

Reverse steps 1 through 7 to replace the IDE 24X CD-ROM drive.

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Diskette Drive

To remove the 1.44 MB diskette drive:

1. Perform the preparation procedures. See page 2-2.
2. Remove the front bezel. See page 2-6.
3. Remove the top cover. See page 2-10.
4. Disconnect all cables from the diskette drive.
5. Remove the two T-15 screws and washers from the front of the drive.
6. Slide the diskette drive out the front of the chassis.

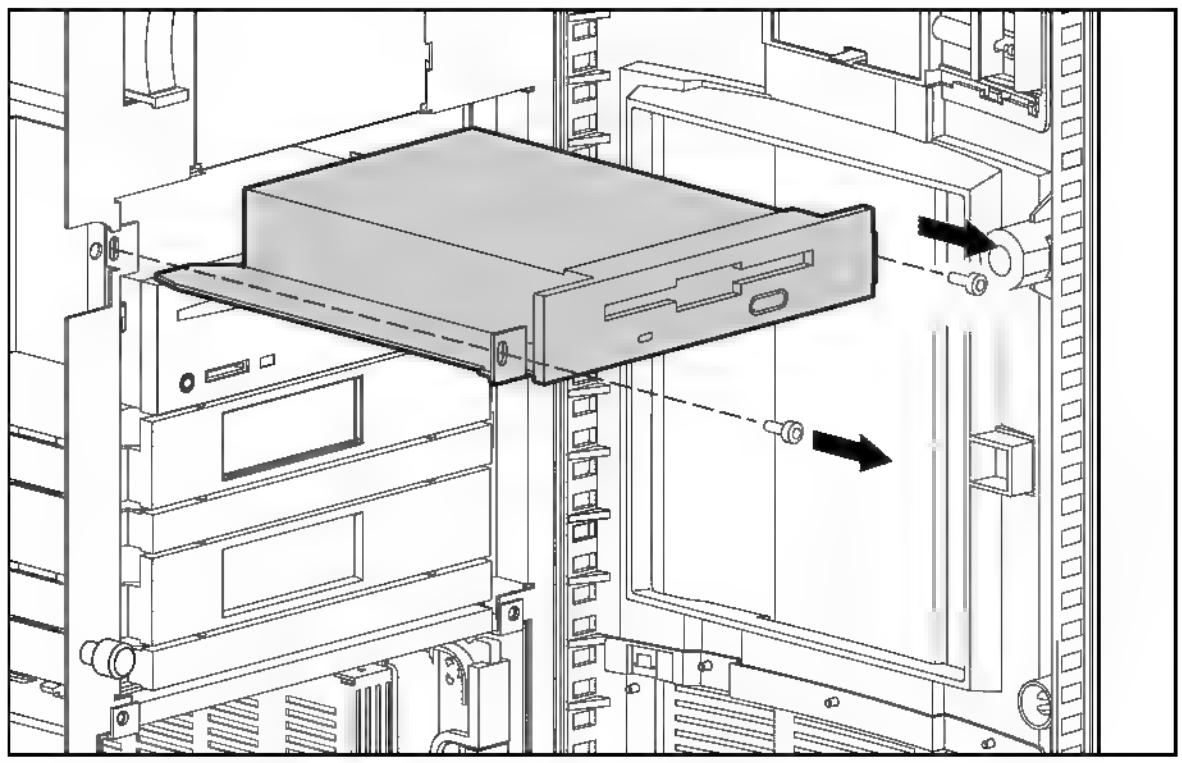

Figure 2-10. Removing the 1.44 MB diskette drive

Reverse steps 1 through 6 to replace the 1.44 MB diskette drive.

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Cable Diagrams

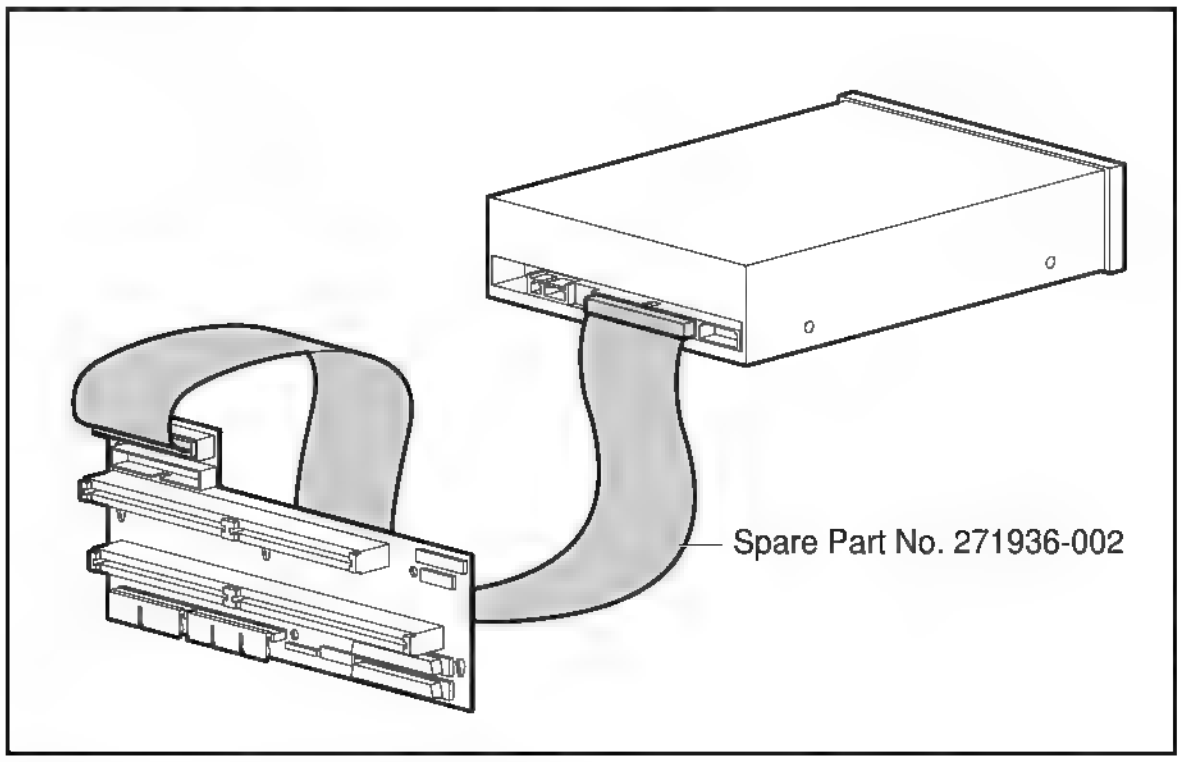

Figure 2-11. IDE 24X CD-ROM drive cable

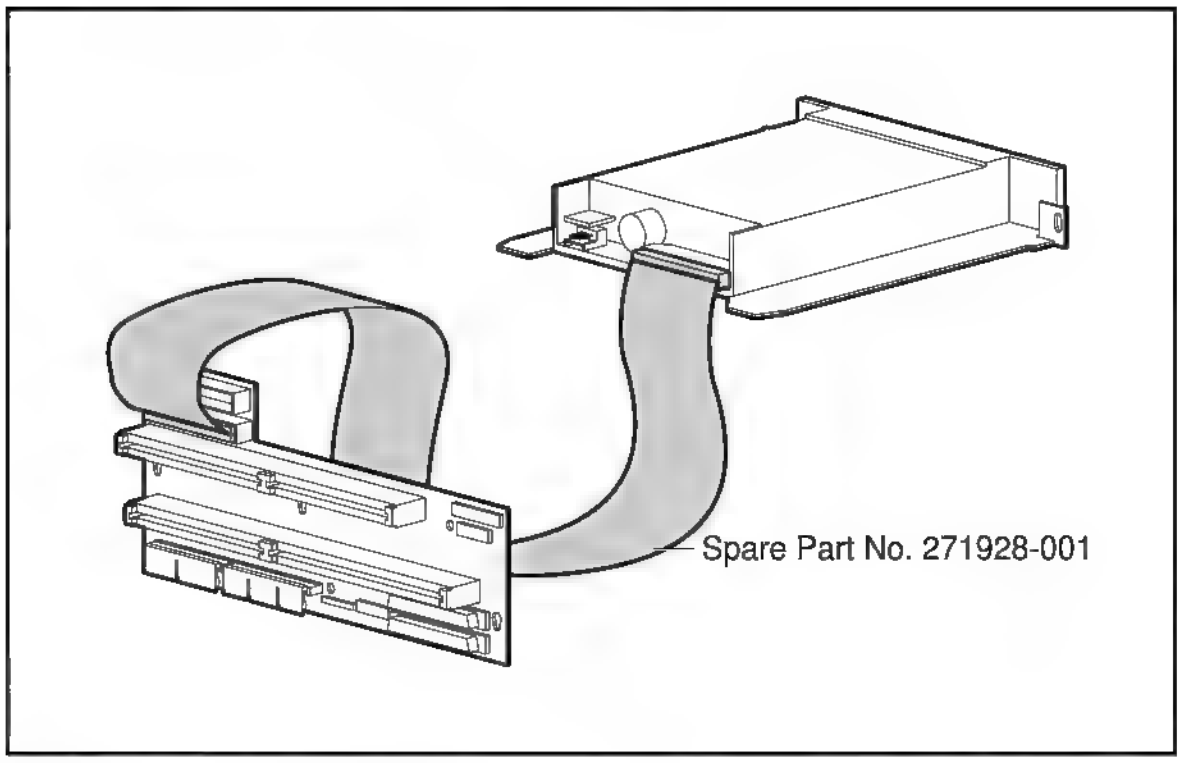

Figure 2-12. Diskette drive cable

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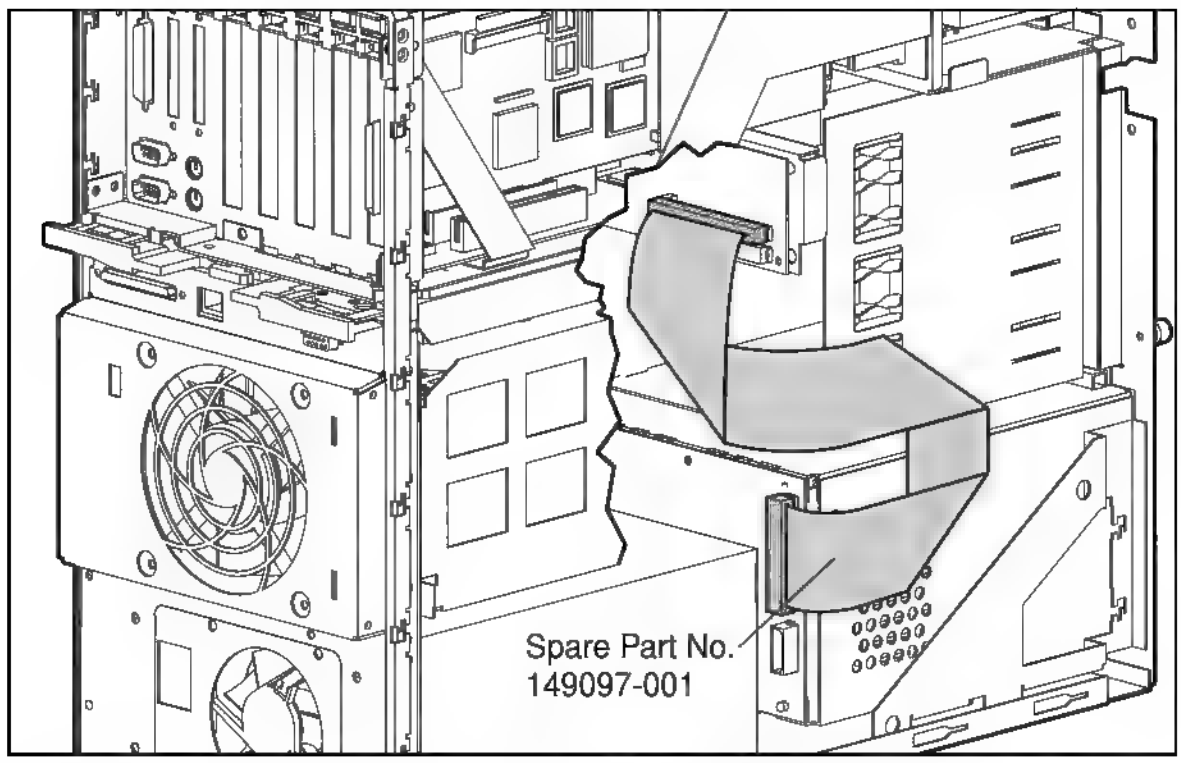

Figure 2-13. Hot-plug drive cage cable (Point to Point SCSI cable)

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System I/O Board Cage

The system I/O board cage contains the system I/O board with PCI slots, system switches, ISA slots, and the battery. Four slots are PCI/ISA; two are PCI only, for a total of six slots.

To remove the system I/O board cage:

1. Perform the preparation procedures. See page 2-2.
2. Remove the top cover. See page 2-10.
3. Disconnect all cables from the system I/O board cage and any installed boards.
4. Remove any installed boards. Place them on a non-conductive work surface. You will install them in the replacement system I/O board cage.

   NOTE: Replace the boards into the same slots from which they were removed in the system I/O board cage.

5. Remove the security screw (if installed) 1.
6. Push down on the cage ejector lever 2, and pull out 3.
7. Pull the system I/O board cage out the back of the chassis 4.

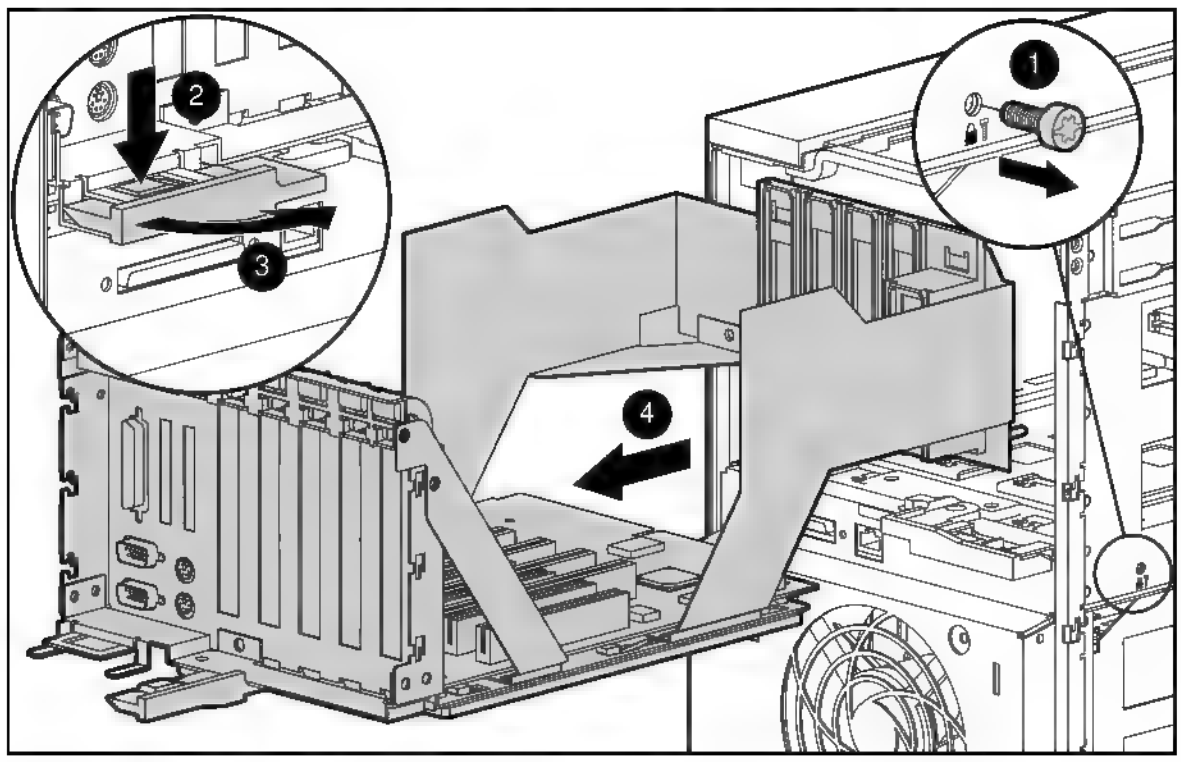

Figure 2-14. Removing the system I/O board cage

Reverse steps 1 through 7 to replace the system I/O board cage. Install any boards removed in step 4 in the replacement system I/O board cage.

NOTE: Replace the boards into the same slots from which they were removed in the system I/O board cage.

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I/O Fan with Bracket

To remove the I/O fan with bracket:

1. Perform the preparation procedures. See page 2-2.
2. Remove the top cover. See page 2-10.
3. Loosen the single thumbscrew attaching the I/O fan with bracket to the chassis 1.
4. Tilt the top of the I/O fan with bracket forward and away from the chassis 2.
5. Disconnect the I/O fan with bracket cable and slide it out of the clip 3.
6. Lift the I/O fan with bracket away from the chassis.

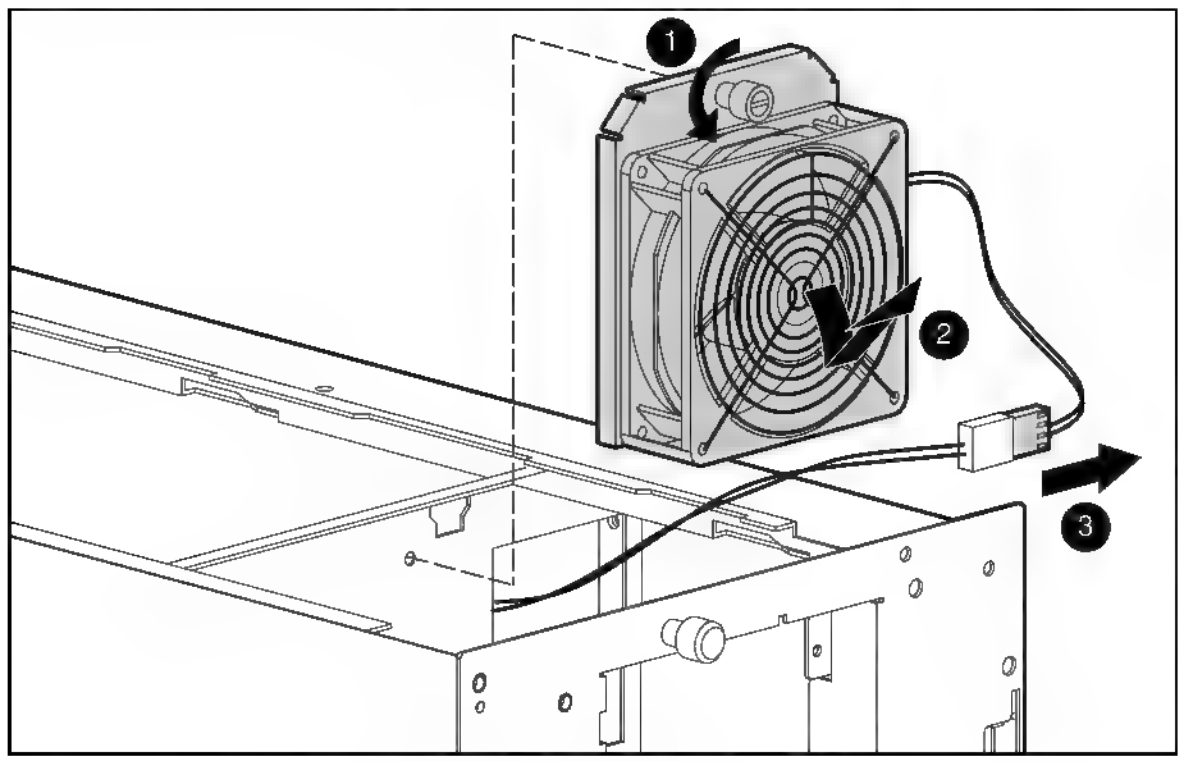

Figure 2-15. Removing the I/O fan with bracket

Reverse steps 1 through 6 to replace the I/O fan with bracket.

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Power Switch

To remove the power switch and cable assembly:

WARNING: Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator-serviceable parts. To reduce the risk of injury from electrical shock hazards, do not open this enclosure.

1. Perform the preparation procedures. See page 2-2.
2. Remove the front bezel. See page 2-6.
3. Remove the top cover. See page 2-10.
4. Remove the single T-15 screw 1.
5. Slide the power switch housing back 2 and lift it out of the chassis 3.

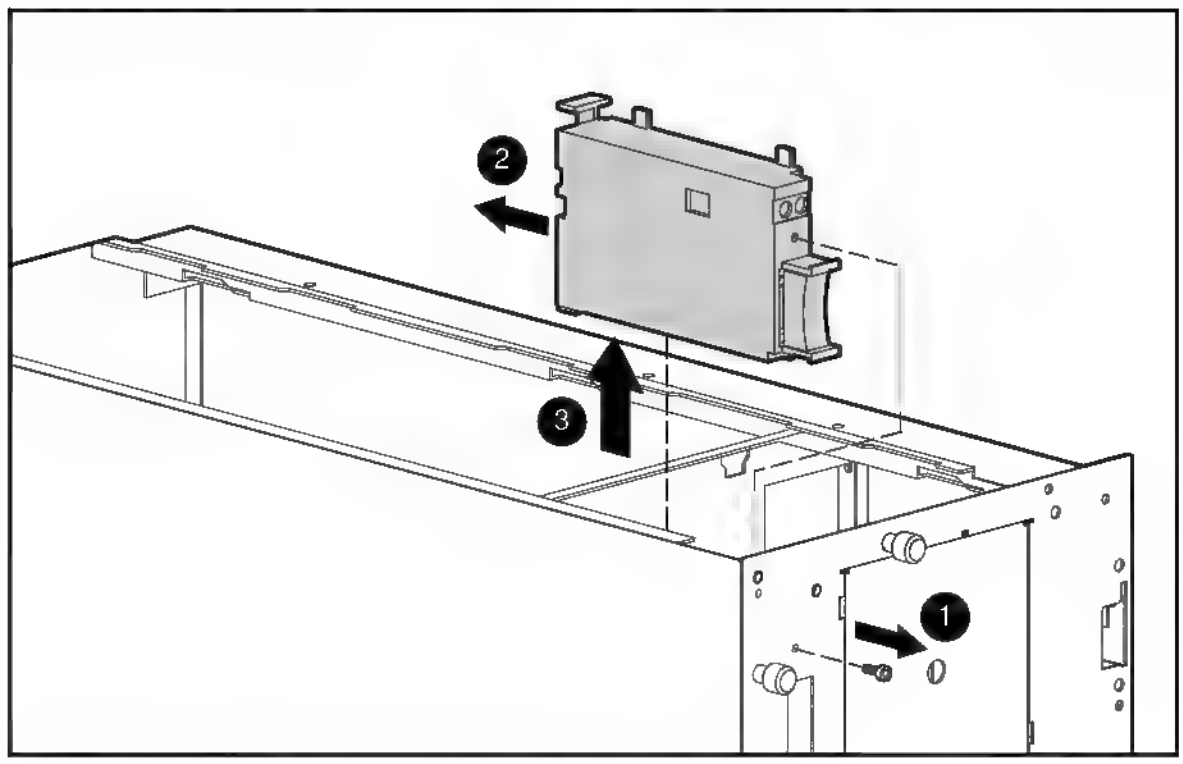

Figure 2-16. Removing the power switch housing

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6. Unwind the power supply cables and LED cables from the strain-relief casing and disconnect them from the power switch.

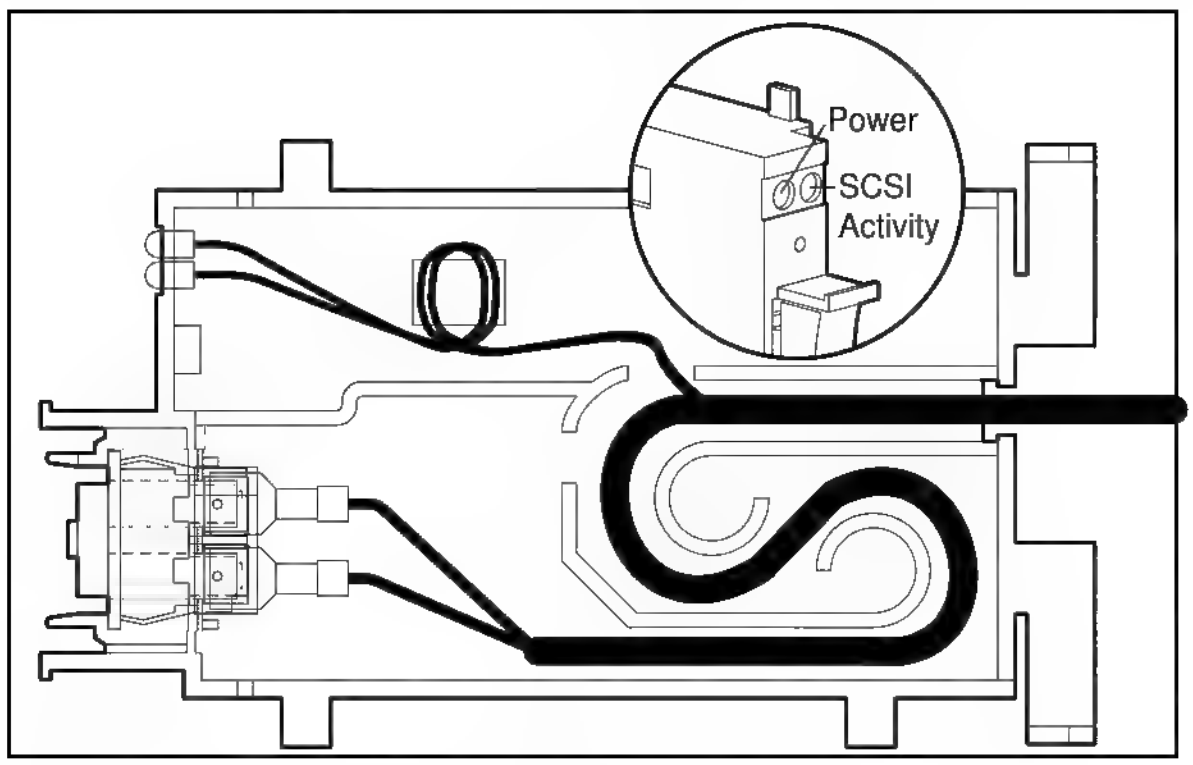

Figure 2-17. Disconnecting the power switch cables

Reverse steps 1 through 6 to replace the power switch and cable assembly.

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Processor Cage Assembly

The processor cage assembly contains the processor cage, processor board, processor, processor power module, and memory. See Chapter 1, "Illustrated Parts Catalog," for the spare part numbers for these items.

Processor Cage

To remove the processor cage:

1. Perform the preparation procedures. See page 2-2.
2. Disconnect all cables from the rear exterior of the processor cage.
3. Remove the security screw (if installed) 1.
4. Push up on the processor cage ejector lever 2, and pull out 3.

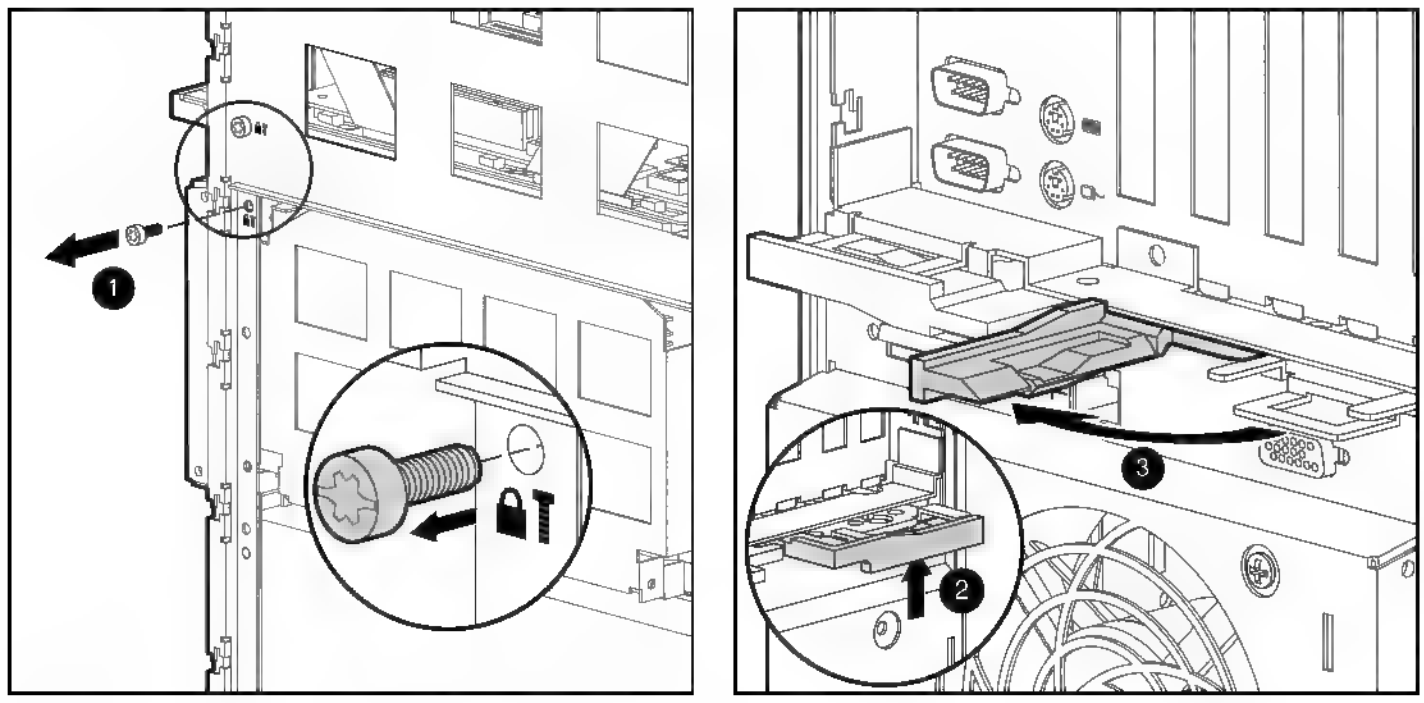

Figure 2-18. Pulling out the processor cage lever

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5. Pull the processor cage out through the back of the chassis.

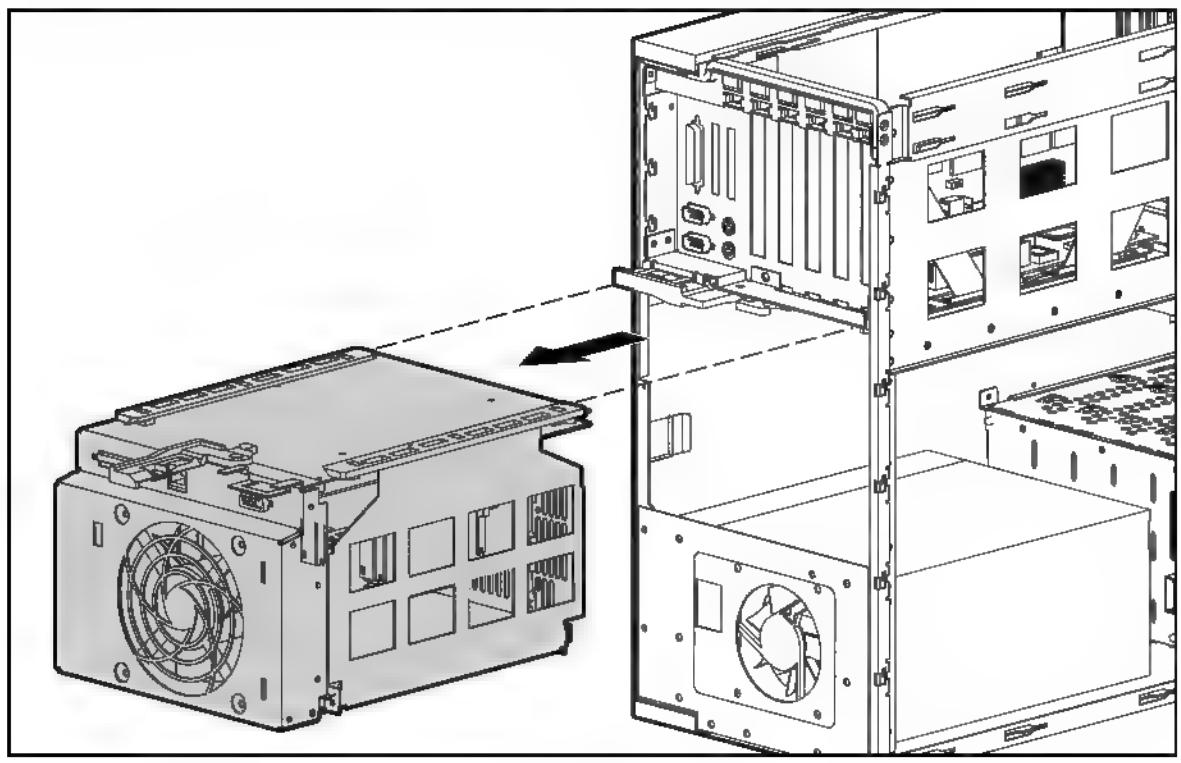

Figure 2-19. Removing the processor cage

Reverse steps 1 through 5 to replace the processor cage.

NOTE: Replace the spare parts into the same slots and sockets from which they were removed in the system I/O board cage.

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Processor

To remove the processor:

1. Perform the preparation procedures. See page 2-2.
2. Remove the processor cage (see page 2-22) and open the cage door.
3. Push in the latches on each side of the processor until you hear two clicks 1. This locks the tabs in the open position.
4. Lift the processor from the processor cage 2.

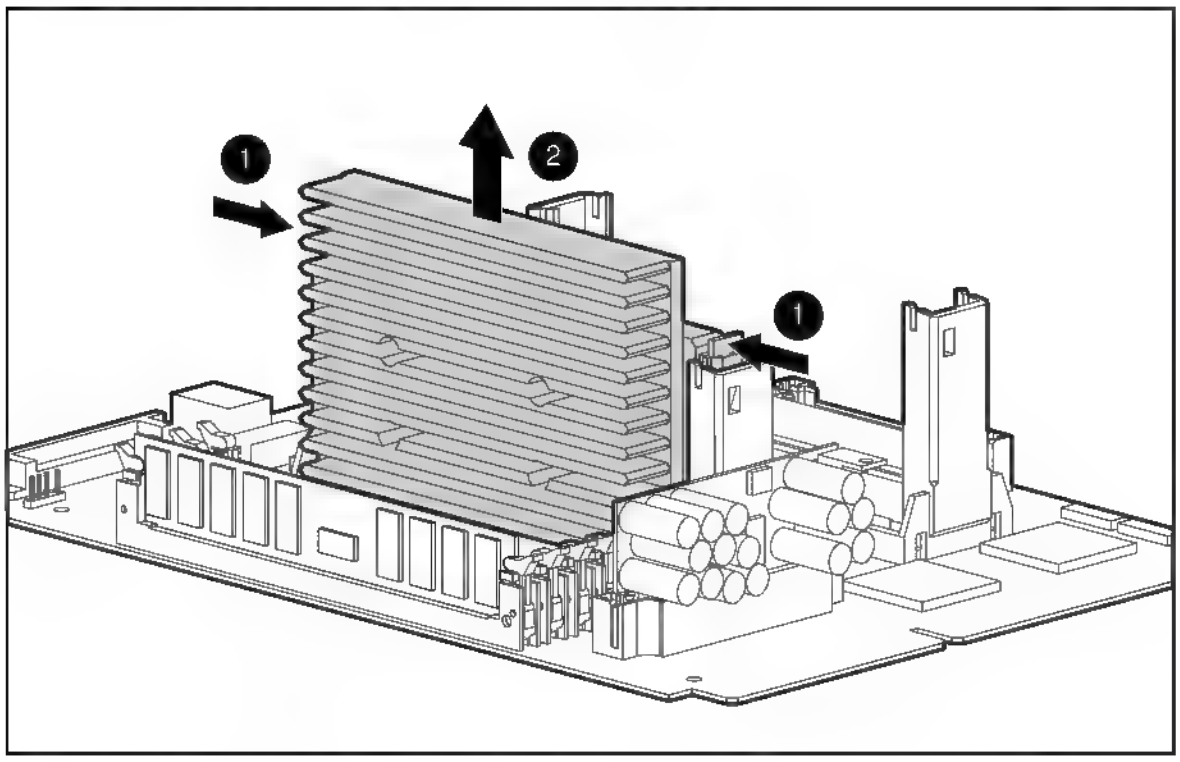

Figure 2-20. Removing the processor

Reverse steps 1 through 4 to replace the processor.

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Processor Retention Bracket

To remove the processor retention bracket:

1. Perform the preparation procedures. See page 2-2.
2. Remove the processor cage (see page 2-22) and open the cage door.
3. Lift the processor from the processor cage. See page 2-24.
4. Remove the two security screws, 1 and lift the processor retention bracket from the processor board and cage 2.

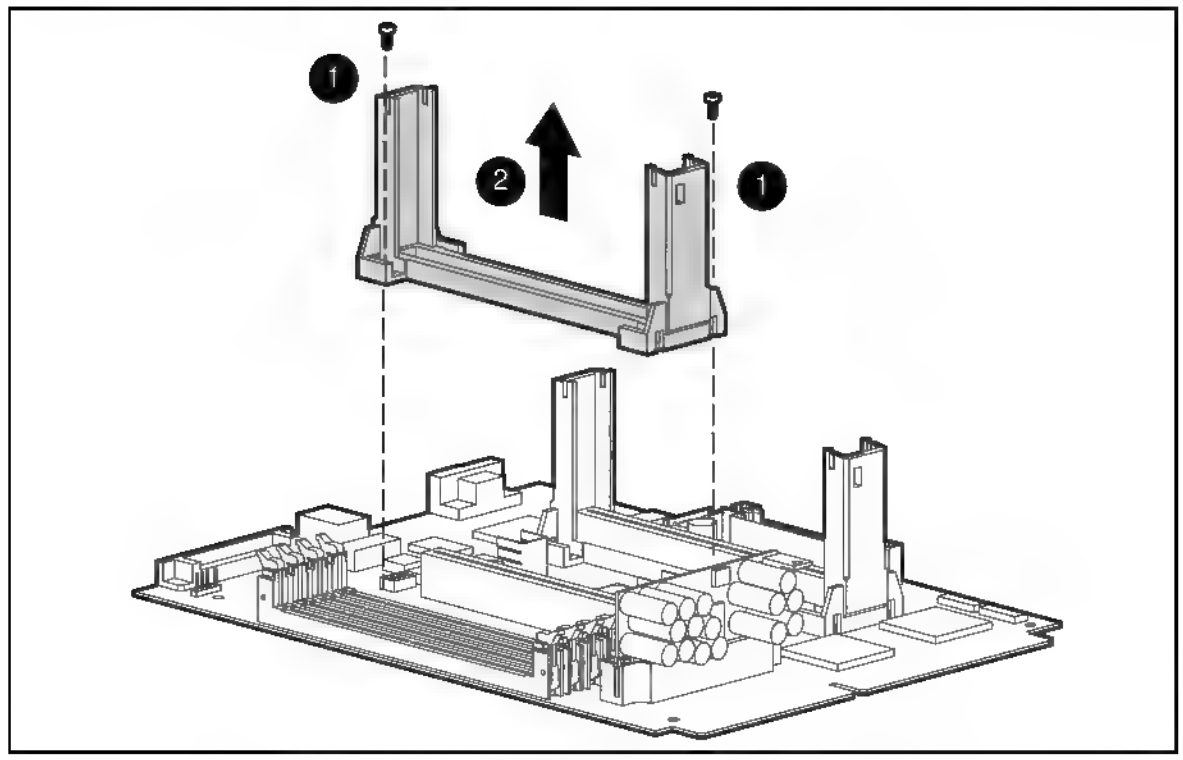

Figure 2-21. Removing the processor retention bracket.

Reverse steps 1 through 4 to replace the processor retention bracket.

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Processor Power Module

To remove the processor power module:

1. Perform the preparation procedures. See page 2-2.
2. Remove the processor cage (see page 2-22) and open the cage door.
3. Pull out the clips on each end of the processor power module 1.
4. Lift the processor power module from the processor cage 2.

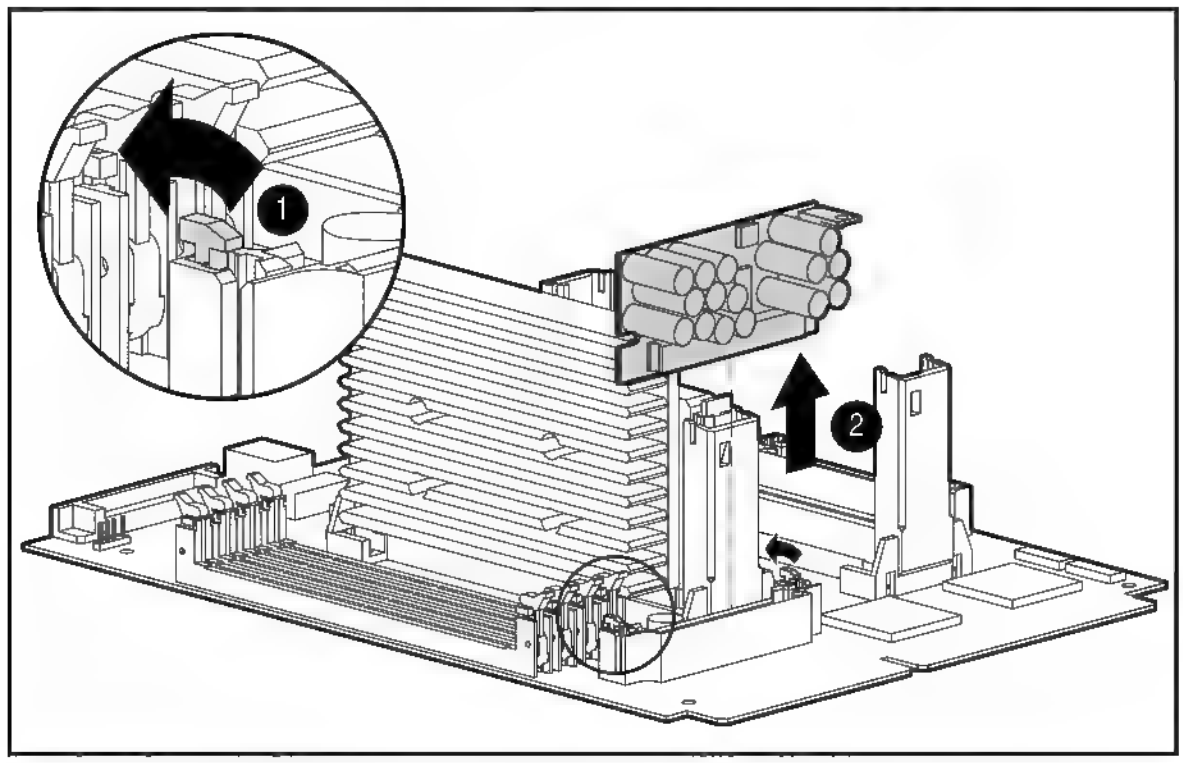

Figure 2-22. Removing the processor power module

Reverse steps 1 through 4 to replace a processor power module in the Compaq ProLiant 1600 server. The clips on the processor power module will snap into a locked position automatically when the processor power module is pushed into its slot.

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Memory

Compaq ProLiant 1600 servers ship standard with 64 MB of memory installed on the processor board in socket 4. Memory is expandable to 1GB.

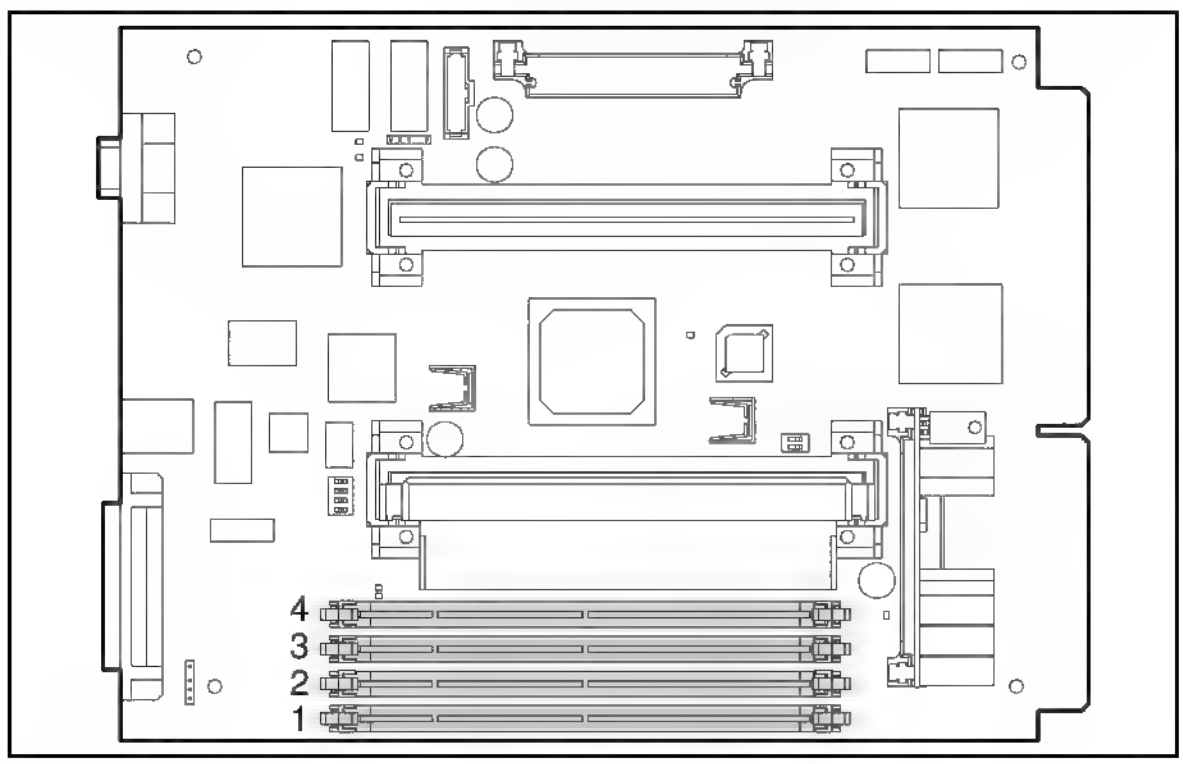

Figure 2-23. SDRAM DIMM Sockets on the processor board

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The following guidelines **MUST** be followed when installing or replacing memory:

Use 100 MHz, 32-, 64-,128-, or 256-MB; registered SDRAM DIMMs.

> **CAUTION:** Use only Compaq SDRAM DIMMs. SDRAM DIMMs from other sources may adversely affect data integrity. Power-On Self-Test (POST) will warn of non-supported SDRAM DIMMs.

To remove a SDRAM DIMM:

1. Perform the preparation procedures. See page 2-2.
2. Remove the processor cage and place it on a non-conductive work surface. See page 2-22. Open the cage door.
3. Locate the appropriate memory socket on the processor board.
4. Push the levers on each end of the memory module 1.
5. Pull the module from the board 2.

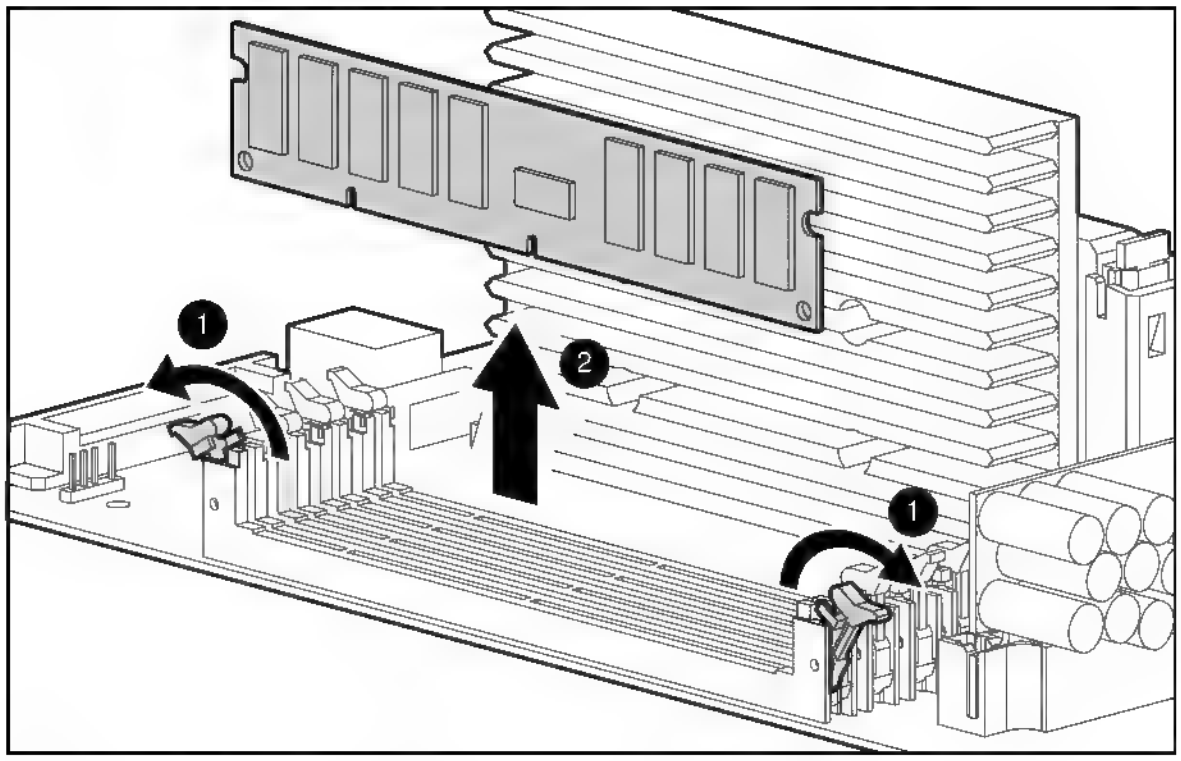

Figure 2-24. Removing a SDRAM DIMM from the processor board

Reverse steps 1 through 5 to replace the SDRAM DIMM. This memory module can be installed in one way only. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, making sure that the module is inserted fully and seated properly.

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Power Supply

To remove the power supply:

1. Perform the preparation procedures. See page 2-2.
2. Remove the left side access panel. See page 2-9.
3. Remove the processor cage. See page 2-22.
4. Slide the hot-pluggable drive cage out slightly 1. See Figure 2-8 to determine which screws should be removed.
5. Remove the air baffle by detaching the hook-and-loop fastener holding it to the power supply.
6. Disconnect the power supply cable from the power switch. See Figure 2-17 on page 2-20.
7. Disconnect all other power supply cables.
8. Remove four T-15 screws securing the power supply to the back of the chassis 2.
9. Pull the power supply out the side of the chassis 3.

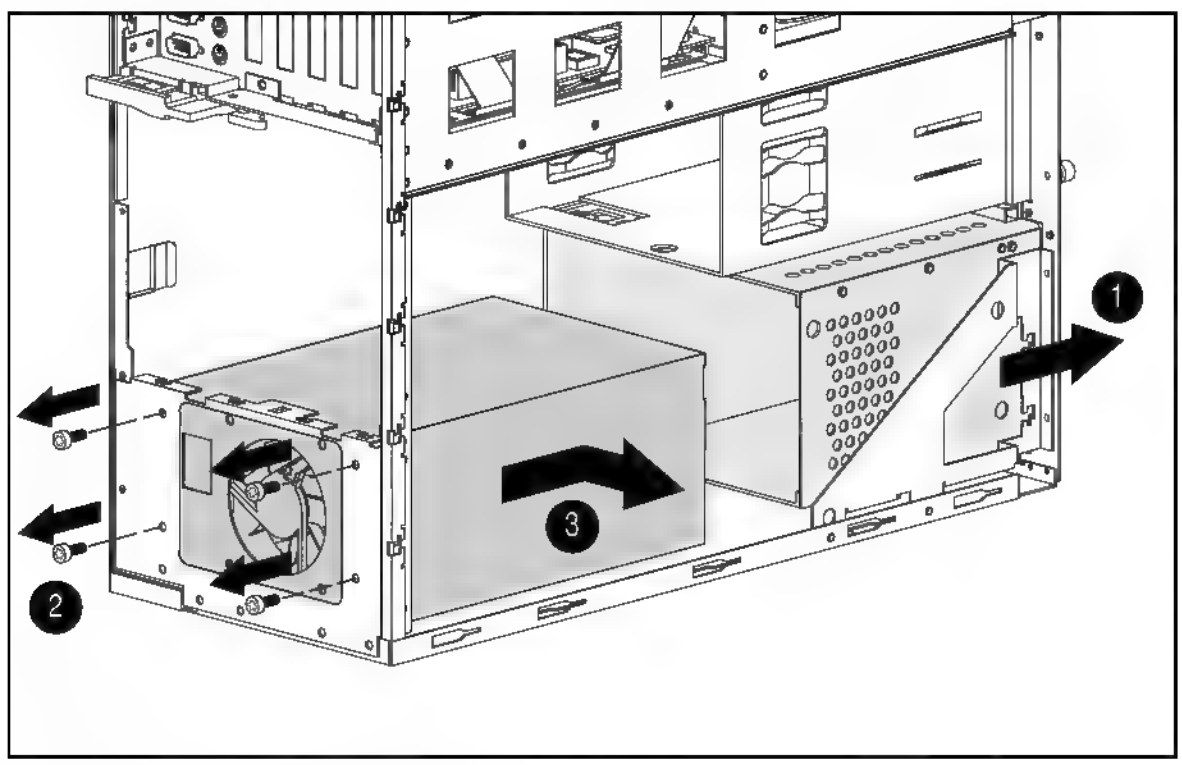

Figure 2-25. Removing the power supply

Reverse steps 1 through 9 to replace the power supply.

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When reconnecting the cables from the power supply to the backplane board, match cables P1, P2, and P5 with the appropriate connectors. Cable P5 should plug into the far left side of connector P5. Figure 2-26 depicts the positions of these cable connectors on the backplane board.

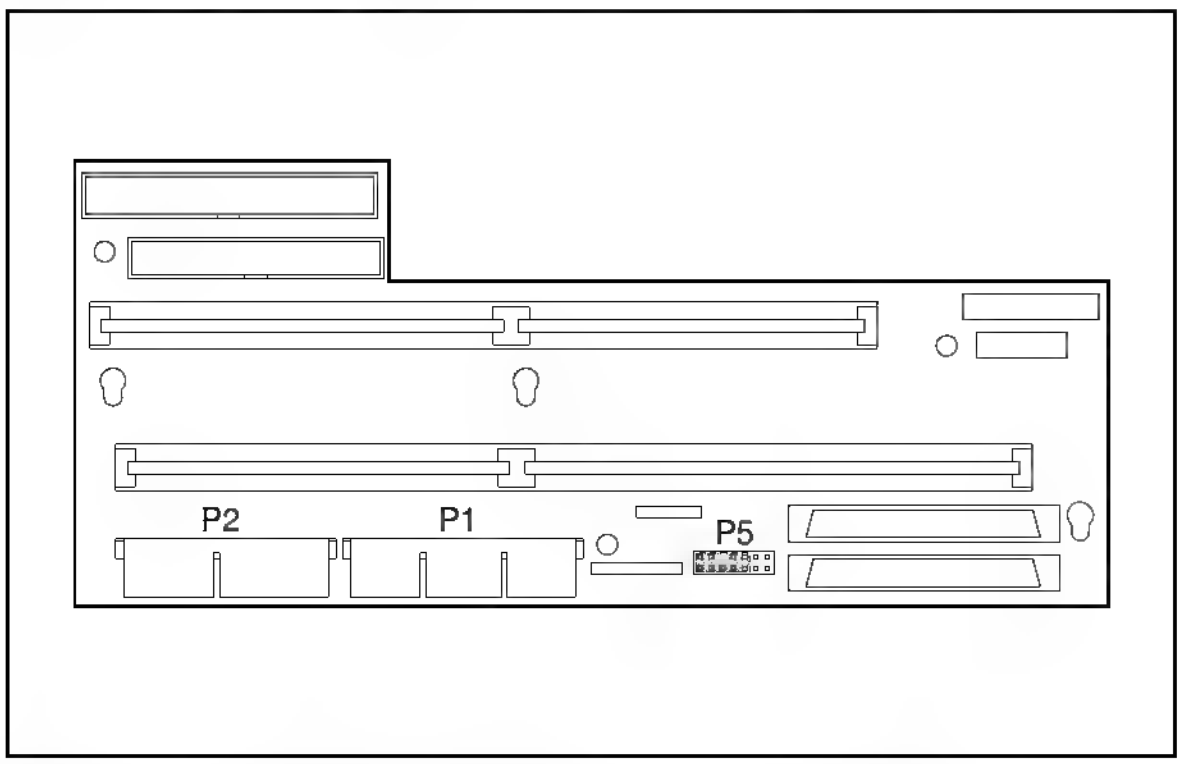

Figure 2-26. Power supply cable connections on the backplane board

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Backplane Board

To remove the backplane board:

1. Perform the preparation procedures. See page 2-2.
2. Remove the top cover. See page 2-10.
3. Remove the left side access panel. See page 2-9.
4. Remove the system I/O board cage. See page 2-18.
5. Remove the processor cage. See page 2-22.
6. Disconnect all cables from the backplane board.
7. Remove the three T-15 screws from the backplane board.
8. Slide the backplane board down slightly and pull it from its mounting posts.

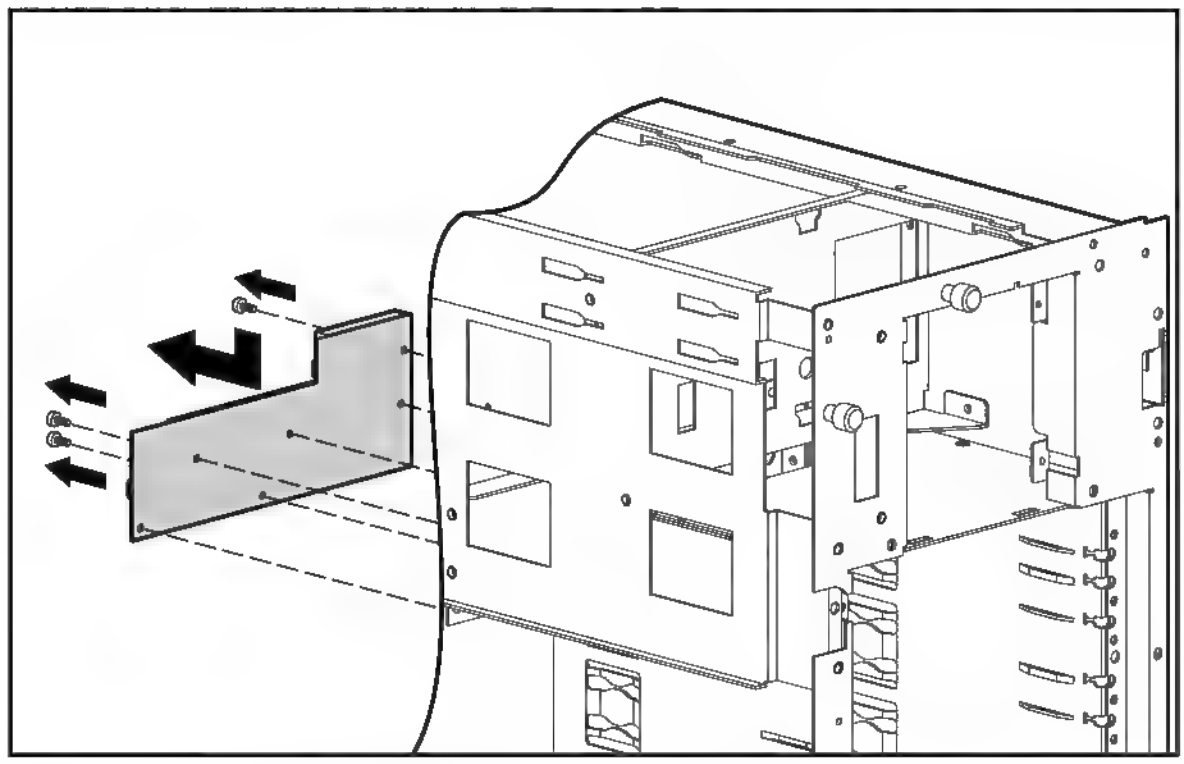

Figure 2-27. Removing the backplane board

Reverse steps 1 through 8 to replace the backplane board.

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External Replacement Battery

> **CAUTION:** Do not remove the lithium battery from the system I/O board or permanent damage may occur. If the battery fails, use the external
> replacement battery.

To install the external replacement battery:

1. Perform the preparation procedures. See page 2-2.
2. Remove the top cover. See page 2-10.
3. Connect the replacement battery to the battery header on the system I/O board.
4. Remove the adhesive backing from the hook-and-loop fastener strip. Place the battery and the hook-and-loop fastener strip as indicated in the following illustration.

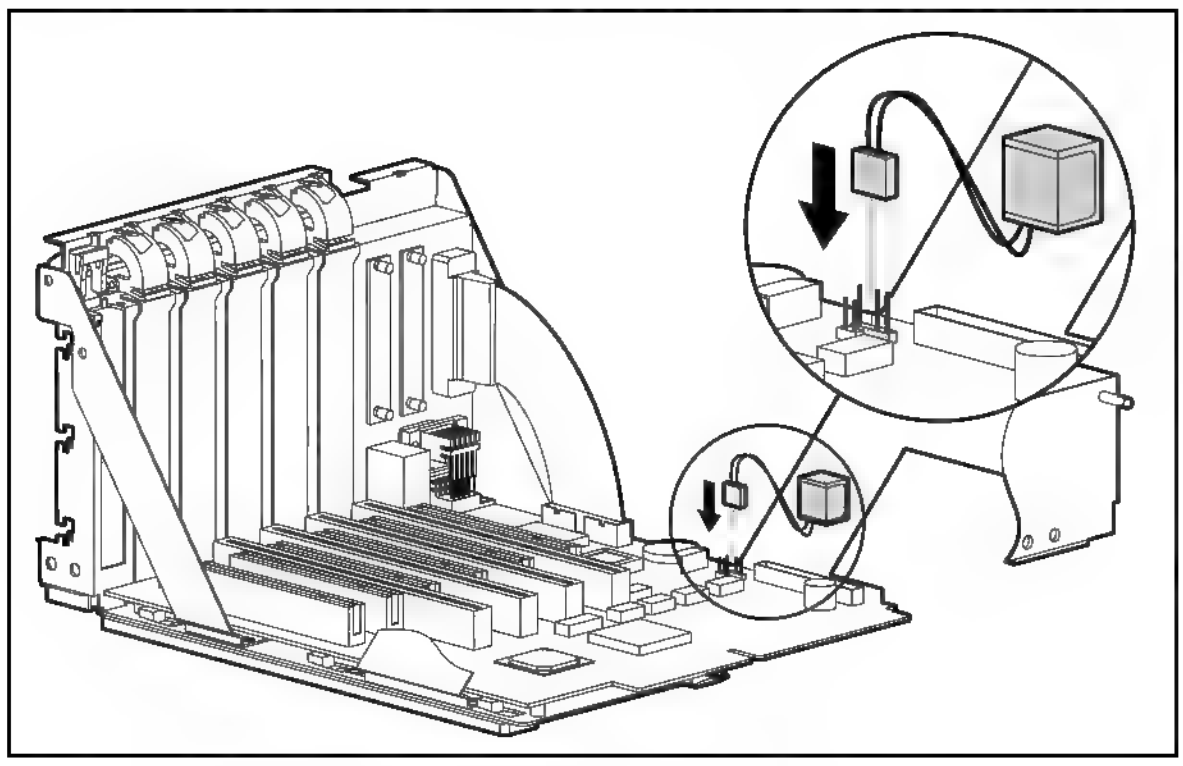

Figure 2-28. Installing the external replacement battery

5. Place the sticker included with your battery kit on the back of your server above the power connector.

NOTE: If an external replacement battery is not installed to replace the lithium battery before it fails, and CMOS/NVRAM is lost, run the System Configuration Utility.

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Chapter 3
Diagnostic Tools

This chapter describes software and firmware diagnostic tools available for all Compaq server products. The sections in this chapter are:

- Utility Access
- Power-On Self-Test (POST)
- Diagnostics Software
- Drive Array Advanced Diagnostics (DAAD)
- Integrated Management Log
- Rapid Recovery Services
- Remote Service Features
- ROMPaq
- Compaq Insight Manager

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Utilities Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain your system, including:

- System Configuration Utility
- Array Configuration Utility
- Drive Array Advanced Diagnostics Utility
- ROMPaq Firmware Upgrade Utilities

> **CAUTION:** Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

There are several ways to access these utilities:

- **Run the utilities on the system partition.**

  If the system was installed using SmartStart, the Compaq utilities will automatically be available on the system partition. The system partition could also have been created during a manual system installation.

To run the utilities on the system partition, boot the system and press **F10** when you see the following message: "Press F10 for system partition utilities." Then select the utilities from the menu.

- System Configuration Utility is available under System Configuration menu.
- Array Configuration Utility is available under the System Configuration menu.
- Drive Array Advanced Diagnostics Utility is available under the Diagnostics and Utilities menu.
- ROMPaq Firmware Upgrade Utility is available under the Diagnostics and Utilities menu.

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■ **Run the utilities from diskette.**

You can also run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.

You can also create a diskette version of the utility from the SmartStart and Support Software CD. To create diskette versions of the utilities from the CD:

1. Boot the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select *Create Support Software* and select *Next*.
3. Select the diskette you would like to create from the list and follow the instructions on the screen.
4. Run the utilities from the Compaq SmartStart and Support Software CD.

IMPORTANT: Only the System Configuration Utility and the Array Configuration Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities can be executed only from the system partition or from diskette.

To run these utilities directly from the Compaq SmartStart and Support Software CD:

1. Boot the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select the utility you wish to run and select *Next*.
   - ❑ To execute the System Configuration Utility, select *Run System Configuration Utility*.
   - ❑ To execute the Array Configuration Utility, select *Run Array Configuration Utility*.

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Power-On Self-Test (POST)

POST is a series of diagnostic tests that runs automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

- Keyboard
- Power supply
- System board
- Memory
- Memory expansion boards
- Controllers
- Diskette drives
- Hard drives

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. If an error code is displayed on the screen during POST or after resetting the system, follow the instructions in Table 3-1. The error messages and codes listed in Table 3-1 include all codes generated by Compaq products. Your system generates only those codes that are applicable to your configuration and options.

Table 3-1
POST Error Messages

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
A Critical Error occurred prior to this power-up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
101-ROM Error	1L,1S	System ROM checksum.	Run Diagnostics. Replace failed assembly as indicated.
101-I/O ROM Error	None	Options ROM checksum.	Run Diagnostics. Replace failed assembly as indicated.
102-System Board Failure	None	DMA, timers, etc.	Replace the system board. Run the Compaq System Configuration Utility.
104-ASR-2 Timer Failure	None	System board failure.	Run Diagnostics. Replace failed assembly as indicated.
162-System Options Not Set	2S	Configuration incorrect.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Run the System Configuration Utility and correct.
164-Memory Size Error	2S	Configuration memory incorrect.	Run the System Configuration Utility and correct.
170- Expansion Device Not Responding	None	EISA or PCI expansion board failure.	Check board for secure installation. Replace the failed board if necessary.
172-Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt or jumper installed.	Run the System Configuration Utility and correct.
172-1 Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt.	Run the System Configuration Utility and correct.
172-2 IRC Configuration Invalid	None	IRC enabled and video controller is in PCI slot on the secondary bus.	Move video controller to a PCI slot on the primary PCI bus.
173- Slot ID Mismatch	None	Board replaced, configuration not updated.	Run the System Configuration Utility and correct.
174-Configuration/Slot Mismatch Device Not Found	None	EISA or PCI board not found.	Run the System Configuration Utility and correct.
175-Configuration/Slot Mismatch Device Found	None	EISA or PCI board added, configuration not updated.	Run the System Configuration Utility and correct.
176-Slot with Not Readable ID Yields Valid ID	None	EISA or PCI board in slot that should contain an ISA board.	Run the System Configuration Utility and correct.
177-Configuration Not Complete	None	Incomplete System Configuration.	Run the System Configuration Utility and correct.

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178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the System Configuration Utility and correct.
179-System Revision Mismatch	None	A board was installed that has a different revision date.	Run the System Configuration Utility and correct.

Continued

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
180-Log Reinitialized	None		
201-Memory Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.
203-Memory Address Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.
205-Cache Memory Error	None	Cache memory error.	Replace the processor board in the slot indicated.
205-Option Cache Memory Error	None	Option cache memory error.	Replace the option cache board.
206-Cache Controller Error	None	Cache controller failure.	Run Diagnostics. Replace failed assembly as indicated.
207-Invalid Memory Configuration - Check DIMM [SIMM] Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed - Check DIMM [SIMM] Installation	1L, 1S	The speed of the memory is too slow, where: xx00 = expansion board SIMMs are too slow, or 00yy = system board SIMMs are too slow. xx and yy have corresponding bit set.	The speed of the memory modules must be 60 ns. Verify the speed of the memory modules installed and replace.
210- Invalid Memory Configuration Detected. System halted.	None	Maximum amount of memory exceeded.	Verify installed memory does not exceed 512 MB.
211-Cache Switch Set Incorrectly	None	Switch not set properly during installation or upgrade.	Verify switch settings.

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212-System Processor Failed/Mapped out	1S	Processor in slot x failed.	Run Diagnostics and replace failed processor.
213-Cache Size Error	None	Invalid optional cache size.	Replace cache with 256K cache.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Shor	Probable Source of Problem	Action
213-System Processor Not Installed	1S	System processor configured for slot indicated is missing.	Install processor in the slot indicated or run the System Configuration Utility to remove the processor from the *.CFG* file.
214-DC-DC Converter Failed	None	PowerSafe Module (DC-DC Converter) failed.	Run Diagnostics. Replace failed assembly as indicated.
301-Keyboard Error	None	Keyboard failure.	Turn off the computer, then reconnect the keyboard.
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure.	Replace the keyboard.
ZZ-301-Keyboard Error	None	Keyboard failure. (*ZZ* represents the Keyboard Scan Code.)	1. A key is stuck. Try to free it. 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure.	1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure.	1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.
40X-Parallel Port X Address Assignment Conflict	2S	Both external and internal ports are assigned to parallel port X.	Run the System Configuration Utility and correct.
402-Monochrome Adapter Failure	1L, 2S	Monochrome display controller.	Replace the monochrome display controller.
501-Display Adapter Failure	1L, 2S	Video display controller.	Replace the video board.

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601-Diskette Controller Error	None	Diskette controller circuitry failure.	1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace the system board.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
605-Diskette Drive Type Error	2S	Mismatch in drive type.	Run the System Configuration Utility to set diskette type correctly.
702-A coprocessor has been detected that was not reported by CMOS	None	Installed coprocessor not configured.	Run the System Configuration Utility and correct.
703-CMOS reports a coprocessor that has not been detected	2S	Coprocessor or configuration error.	1. Run the System Configuration Utility and correct. 2. Replace the coprocessor.
1151-Com Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run the System Configuration Utility and correct.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2, COM3 or COM4.	Run the System Configuration Utility and correct.
1600-Server Manager/R Failure	None	Server Manager/R board failure. Error code displays after error message.	Run Diagnostics. Replace failed assembly as indicated.
1610-Temperature violation detected. Waiting for system to cool	2S	Ambient system temperature too hot.	Check fan in system environment.
1611-Fan [fan description] failure detected	2S	Required fan has failed.	Check fans.
1611- Fan [fan description] not present	2S	Fan not present.	Make sure fans are plugged in.

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1612-Primary power supply failure	2S	Primary power supply has failed.	Replace power supply as soon as possible.
1613-Low System Battery	None	Real time clock system battery is running low on power.	Run Diagnostics. Replace failed assembly as indicated.
1614-Redundant fan failure detected	None		

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1615- Power Supply Failure in Bay X	None	A power supply has failed.	Replace or check specified power supply.
1616- Power Supply Configuration Error	2L, 2S	Single power supply system is installed in Bay 2 and not in Bay 1.	Move power supply from Bay 2 to Bay 1.
1701-SCSI Controller failure	None	A test on the Fast SCSI-2 Controller failed	Run Diagnostics. Replace failed assembly as indicated.
1702-SCSI cable error detected. System halted.	None	Incorrect cabling.	1. For integrated SCSI Controllers, ensure that the internal connector has SCSI termination attached. 2. For option card SCSI controllers, ensure that only one of the two internal connectors has termination attached.
1703-SCSI cable error detected. Internal SCSI cable not attached to system board connector. System halted.	None	Incorrect cabling.	Ensure that the integrated SCSI controller has SCSI termination attached.
1704- Unsupported Virtual Mode Disk Operation. DOS Driver Required. System halted.	None	System attempted to perform a virtual mode disk operation without virtual mode memory services.	Use fixed-disk device driver that supports virtual mode memory services.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1705-Locked SCSI Bus Detected. System halted.	None	SCSI bus failure.	Run Diagnostics. Replace failed assembly as indicated.
1730-Fixed Disk 0 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1731-Fixed Disk 1 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1740-Fixed Disk 0 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1741-Fixed Disk 1 failed Set Block Mode command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1750-Fixed Disk 0 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1751-Fixed Disk 1 failed Identify command	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1760-Fixed Disk 0 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1761-Fixed Disk 1 does not support Block Mode	None	Fixed disk drive error.	Run the System Configuration Utility and correct.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1764-Slot x Drive Array - Capacity Expansion Process is temporarily disabled (followed by one of the following): Expansion will resume when Array Accelerator has been reattached. Expansion will resume when Array Accelerator has been replaced. Expansion will resume when Array Accelerator RAM allocation is successful. Expansion will resume when Array Accelerator battery reaches full charge. Expansion will resume when automatic data recovery has been completed.			Reattach or replace Array Accelerator, wait until the Array Accelerator batteries have charged, or for Automatic Data Recovery to complete, as indicated.
1765-Slot x Drive Array Option ROM Appears to Conflict With an ISA Card. ISA cards with 16-bit memory cannot be configured in memory range C0000 to DFFFF along with the SMART-2/E 8-bit Option ROM due to EISA bus limitations. Please remove or reconfigure your ISA card.			Remove or reconfigure conflicting ISA cards. Disable "shared memory" on any ISA network cards that may be installed.
1766-Slot x Drive Array requires System ROM Upgrade. Run Systems ROMPaq Utility.			Run the latest Systems ROMPaq Utility to upgrade your System ROMs.
1767-Slot x Drive Array Option ROM is Not Programmed Correctly or may Conflict with the Memory Address Range of an ISA Card. Check the Memory Address Configuration of installed ISA Card(s) or run Options ROMPaq Utility to attempt SMART-2/E Option ROM Reprogramming.			Remove or reconfigure conflicting ISA cards, especially any cards that are not recognized by the System Configuration Utility. Try reprogramming the SMART-2/E Controller's ROMs using the latest Options ROMPaq (version 2.29 or higher).
1768-Slot x Drive Array -Resuming logical drive expansion process.	None	SMART-2 Controller error	No action required. Appears whenever a controller reset or power cycle occurs while array expansion is in progress.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1769-Slot x Drive Array - Drive(s) disabled due to failure during expand. Select **F1** to continue with logical drives disabled. Select **F2** to accept data loss and to re-enable logical drives.	None	SMART-2 Controller error.	Data has been lost while expanding the array, therefore the drives have been temporarily disabled. Press **F2** to accept the data loss and re-enable the logical drives. Restore data from backup.
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the System Configuration Utility and correct.
1773-Primary Fixed Disk Port Assignment Conflict	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1774-Slot x Drive Array - Obsolete data found in Array Accelerator. Select **F1** to discard contents of Array Accelerator. Select **F2** to write contents of Array Accelerator to drives.	None	SMART-2 Controller error.	Data found in Array Accelerator is older than data found on drives. Press **F1** to discard the older data in the Array Accelerator and retain the newer data on the drives.

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1776-Drive Array - SCSI Port Termination Error	None	External and internal SCSI drives are both configured to Port 1.	Reconfigure drives.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1777-Drive Array External Drive Subsystem Error	None	Cooling fan failure, internal temperature alert or open side panel.	Inspect for cooling fan failure or open side panel.
1778-Drive Array resuming Automatic Data Recovery process	None	This message appears whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Drive Array Controller detects replacement drives	None	Intermittent drive failure and/or possible loss of data.	If this message appears and drive *X* has not been replaced, this indicates an intermittent drive failure. This message also appears once immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.
1781-Disk 1 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.
1782-Disk Controller Failure	None	Hard disk drive circuitry error.	Run Diagnostics. Replace failed assembly as indicated.
1784-Drive Array Drive Failure, Physical Drive	None	Defective drive and/or cables.	Check for loose cables. Replace defective drive *X* and/or cable(s).
1785-Drive Array not Configured	None	Configuration error.	Run the System Configuration Utility and correct.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1786-Drive Array Recovery Needed The following drive(s) need Automatic Data Recovery: Drive *X*. Select "F1" to continue with recovery of data to drive(s). Select "F2" to continue without recovery of data to drive(s).	None	Interim Data Recovery mode. Data has not been recovered yet.	Press **F1** key to allow Automatic Data Recovery to begin. Data will automatically be restored to drive *X* now that the drive has been replaced or now seems to be working. -Or- Press the **F2** key and the system will continue to operate in the Interim Data Recovery mode.
1787-Drive Array Operating in Interim Recovery Mode. Physical drive replacement needed: Drive *X*	None	Hard drive *X* failed or cable is loose or defective. Following a system restart, this message reminds you that drive *X* is defective and fault tolerance is being used.	1. Replace drive X as soon as possible. 2. Check loose cables. 3. Replace defective cables.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
*1788-Incorrect Drive Replaced: Drive *X* Drive(s) were incorrectly replaced: Drive *Y* Select "F1" to continue - drive array will remain disabled. Select "F2" to reset configuration - all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.
1789-Drive Not Responding, Physical Drive Check cables or replace physical drive *X*. Select "F1" to continue - drive array will remain disabled. Select "F2" to fail drive(s) that are not responding - Interim Recovery Mode will be enabled if configured for fault tolerance.	None	Cable or hard drive failure.	1. Check the cable connections. 2. If cables are connected, replace the drive. 3. If you do not want to replace the drives now, press **F2**.

***NOTE**: The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive or by noise on the data cable. If this message was due to a bad power cable connection, but not because of an incorrect drive replacement, repair the connection and press **F2**.

-Or-

If this message was not due to a bad power cable connection, and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1790-Disk 0 Configuration Error	None	Hard drive error or wrong drive type	Run the System Configuration Utility and Diagnostics and correct.
1791-Disk 1 Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Power was then restored within eight to ten days, and the data in the Array Accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.
1793-Drive Array - Array Accelerator Battery Depleted - Data Lost (Error message 1794 also displays.)	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Array Accelerator batteries failed. Data in Array Accelerator has been lost.	Power was not restored within eight to ten days. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.
1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	This is a warning that the battery charge is below 75%. Posted-writes are disabled.	Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1795-Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. The data stored in the Array Accelerator does not correspond to this drive array.	Match the Array Accelerator to the correct drive array, or run the System Configuration Utility to clear the data in the Array Accelerator.
1796-Drive Array - Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array Accelerator is defective or has been removed.	1. Check that the Array Accelerator is properly seated. 2. Run the System Configuration Utility to reconfigure the Compaq IDA-2 without the Array Accelerator.
1797-Drive Array - Array Accelerator Read Error Occurred.Data in Array Accelerator has been lost.Array Accelerator is disabled.	None	Hard parity error while reading data from posted-writes memory.	Enable Array Accelerator.

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POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1798-Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error while writing data to posted-writes memory.	Enable Array Accelerator.
1799-Drive Array - Drive(s) Disabled due to Array Accelerator Data Loss.Select "F1" to continue with logical drives disabled. Select "F2" to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press **F1** to continue with logical drives disabled or **F2** to accept data loss and re-enable logical drive.
Beeps only: 2 Long + 2 Short	2L, 2S	Power is cycled. Temperature too hot. Processor fan not installed or spinning.	Check fans.
(Run System Configuration Utility - **F10** key)	None	A configuration error occurred during POST.	Press **F10** to run System Configuration Utility.
(RESUME - **F1** KEY)	None	As indicated to continue.	Press the **F1** key.

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Diagnostics Software

Tables 3-2 through 3-20 include all test error codes generated by Compaq products. Each code has a corresponding description and recommended action(s). Your system generates only those codes that are applicable to your configuration and options.

When you select Diagnostics and Utilities from the System Configuration Utility main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the system partition on the hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. You can create a Diagnostics diskette from the SmartStart CD and run Diagnostics from diskette.

The following options are available from the Diagnostics and Utilities menu:

- Test Computer
- Inspect Computer
- Upgrade Firmware
- Remote Utilities
- Diagnose Drive Array

Diagnostic error codes are generated when the Diagnostics software recognizes a problem. These error codes, listed in tables 3-2 through 3-20, help identify possible defective subassemblies.

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the Diagnostics program again. Follow this procedure until the Diagnostics program no longer detects an error condition.

If you encounter an error condition, complete the following steps before starting problem isolation procedures:

1. Be certain proper ventilation exists. The computer should have approximately 12 inches (30.5 cm) clearance at the front and back of the system unit.
2. Turn off the computer and peripheral devices.
3. Disconnect any peripheral devices not required for testing. Do not disconnect the printer if you want to test it or use it to log error messages.
4. Turn on the computer.
5. Delete the power-on password, if set. You will know that the power-on password is set when a key icon appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password, a forward slash (/), and press the **Enter** key.
6. Disable the power-on password by using the Password Disable switch on the system board, if you do not have access to the password.

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7. Install a loopback plug (Part Number 142054-001), when required by Diagnostics.
8. Run the latest version of Diagnostics.

Running Diagnostics

There are two ways to access the utilities:

- From the System Partition.
- From diskette. A diskette can be created from the SmartStart CD.

1. Accessing the utilities from the system partition:
2. Reboot the server by pressing the **Ctrl+Alt+Delete** keys.

   Press **F10** when the following prompt appears at the top of the screen during POST.

   > Press "**F10**" for System Partition Utilities.

   IMPORTANT: The text appears for only two seconds. If you do not press **F10** during this time, you must reboot the server.

3. From the System Configuration Main Menu, select *Diagnostics and Utilities.*

   If there are errors detected in your Server Health Log, the Diagnostics Utility automatically displays the following screen message:

   > CAUTION: Errors have been detected in you Server Health Log. Diags will now identify your system hardware.

4. Press the **Enter** key to continue.
5. After a short pause, the Server Health Log menu displays with a list of system errors. If there is more than one error, press the Space Bar to select the error you want to correct. Press **Enter**.
6. The Diagnostics Utility prompts you and suggests corrective action.

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Primary Processor Test Error Codes

The 100 series of Diagnostic error codes identifies failures with processor and system board functions. Corrective action may require replacement of system boards or processor assemblies (either processor boards or system boards that include the processor).

Table 3-2
Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed	Replace the processor board and retest.
104-xx 105-xx 106-xx	DMA page registers test failed. Interrupt controller master test failed. Port 61 error. Keyboard controller self-test failed.	For error codes 103-xx through 106-xx, replace the processor board and retest.
107-xx 108-xx 109-xx	CMOS RAM test failed. CMOS interrupt test failed. CMOS clock load data test failed.	The following steps apply to error codes 107-xx through 109-xx. 1. Replace the battery/clock module and retest. 2. Replace the system board and retest.
110-xx 111-xx 112-xx 113-xx	Programmable timer load data test failed. Refresh detect test failed. Speed test slow mode out of range. Protected mode test failed.	For error codes 110-xx through 113-xx, replace the system board and retest.
114-xx	Speaker test failed.	1. Verify the speaker connection and retest. 2. Replace the speaker and retest. 3. Replace the system board and retest.
116-xx	Cache test failed.	Replace the system board and retest.
122-xx 123-xx	Multiprocessor Dispatch test failed. Interprocessor Communication test failed.	The following steps apply to error codes 122-xx through 123-xx 1. Check the system configuration and retest. 2. Replace the processor board and retest. 3. Replace the system board and retest.

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199-xx	Installed devices test failed.	1. Check the system configuration and retest. 2. Verify cable connections and retest. 3. Check switch and/or jumper settings and retest. 4. Run the Configuration utility and retest. 5. Replace the processor board and retest. 6. Replace the system board and retest.

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Memory Test Error Codes

The 200 series of Diagnostic error codes identifies failures with the memory subsystem. Corrective action may require replacement of the memory expansion board, the memory modules, or the processor assembly.

Table 3-3
Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration.	Reinsert memory modules in correct location and retest.
201-xx 202-xx	Memory machine ID test failed. Memory system ROM checksum failed.	The following steps apply to error codes 201-xx and 202-xx: 1. Replace the system ROM and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
203-xx 204-xx 205-xx 206-xx	Memory write/read test failed. Memory address test failed. Walking I/O test failed. Increment pattern test failed.	The following steps apply to error codes 203-xx through 210-xx: 1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
207-xx	Invalid memory configuration-check DIMM installation. DIMMs installed have 8K refresh.	Replace DIMMs.
208-xx	Invalid memory speed detected - check DIMM installation. Slow DIMMs may cause data loss.	Replace DIMMs with timing greater than 60 ns.
210-xx	Random pattern test failed.	1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
215	Non-functioning DC-DC converter for processor X.	Replace the DC-DC converter (processor power module).

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Keyboard Test Error Codes

The 300 series of Diagnostic error codes identifies failures with keyboard and system board functions. Corrective action may require replacement of a keyboard or the system board assembly.

Table 3-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed.	The following steps apply to error codes 301-xx through 304-xx: 1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard and retest. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
302-xx	Keyboard long test failed.	
303-xx	Keyboard LED test, 8042 self-test failed.	
304-xx	Keyboard typematic test failed.	

Parallel Printer Test Error Codes

The 400 series of Diagnostic error codes identifies failures with parallel printer interface card or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected.	The following steps apply to error codes 401-xx through 498-xx: 1. Connect the printer and retest. 2. Check the power to the printer and retest. 3. Install the loopback connector and retest. 4. Check the switch on the Serial/Parallel Interface board (if applicable) and retest. 5. Replace the Serial/Parallel Interface board (if applicable) and retest. 6. Replace the system board and retest.
402-xx	Printer data register failed.	
403-xx	Printer pattern test failed.	
498-xx	Printer failed or not connected.	

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Video Display Unit Test Error Codes

The 500 series of Diagnostic error codes identifies failures with video or system board functions. Corrective action may require replacement of a video board or the system board assembly.

Table 3-6
Video Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Video controller test failed.	The following steps apply to error codes 501-xx through 516-xx: 1. Replace the monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace the system board and retest.
502-xx	Video memory test failed.	
503-xx	Video attribute test failed.	
504-xx	Video character set test failed.	
505-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	
506-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	
507-xx	Video 40 x 25 mode test failed.	
508-xx	Video 320 x 200 mode color set 0 test failed.	
509-xx	Video 320 x 200 mode color set 1 test failed.	
510-xx	Video 640 x 200 mode test failed.	
511-xx	Video screen memory page test failed.	
512-xx	Video gray scale test failed.	
514-xx	Video white screen test failed.	
516-xx	Video noise pattern test failed.	

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Diskette Drive Test Error Codes

The 600 series of Diagnostic error codes identifies failures with diskette, diskette drive, or system board functions. Corrective action may require replacement of a diskette, a diskette drive, or the system board assembly.

Table 3-7
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	The following steps apply to error codes 600-xx through 698-xx: 1. Replace the diskette and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed.	
602-xx	Diskette read test failed.	
603-xx	Diskette write/read/compute test failed.	
604-xx	Diskette random seek test failed.	
605-xx	Diskette ID media failed.	
606-xx	Diskette speed test failed.	
607-xx	Diskette wrap test failed.	
608-xx	Diskette write protect test failed.	
609-xx	Diskette reset controller test failed.	
610-xx	Diskette change line test failed.	
694-xx	Pin 34 is not cut on 360 KB diskette drive.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media ID error.	1. Replace the media and retest. 2. Run the Configuration utility and retest.

Monochrome Video Board Test Error Codes

The 800 series of Diagnostic error codes identifies failures with monochrome video boards or system board functions. Corrective action may require replacement of a monochrome video board or the system board assembly.

Table 3-8
Monochrome Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed.	The following steps apply to error codes 802-xx and 824-xx: 1. Replace monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace monochrome board and retest. 4. Replace the system board and retest.
824-xx	Monochrome video text mode test failed.	

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Serial Test Error Codes

The 1100 series of Diagnostic error codes identifies failures with serial/parallel interface board or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-9
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	The following steps apply to error codes 1101-xx and 1109-xx: 1. Check the switch settings on the Serial/Parallel Interface board (if applicable) and retest. 2. Replace the Serial/Parallel Interface board (if applicable) and retest. 3. Replace the system board and retest.
1109-xx	Clock register test failed.	

Modem Communications Test Error Codes

The 1200 series of Diagnostic error codes identifies failures with the modem(s). Corrective action may require replacement of the modem(s).

Table 3-10
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed.	The following steps apply to error codes 1201-xx through 1210-xx: 1. Refer to the modem documentation for correct setup procedures and retest. 2. Check the modem line and retest. 3. Replace the modem and retest.
1202-xx	Modem time-out test failed.	
1203-xx	Modem external termination test failed.	
1204-xx	Modem auto originate test failed.	
1206-xx	Dial multi-frequency tone test failed.	
1210-xx	Modem direct connect test failed.	

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Fixed Disk Drive Test Error Codes

The 1700 series of Diagnostic error codes identifies failures with fixed disk drives, fixed disk drive controller boards, fixed disk drive cabling, and system board functions. Corrective action may require replacement of fixed disk drive cables, fixed disk drive controller boards, fixed disks, or the system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-11
Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Fixed disk ID drive types test failed.	The following steps apply to error codes 1700-xx through 1799-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the fixed disk drive signal and power cables and retest. 3. Replace the fixed disk drive controller and retest. 4. Replace the fixed disk drive and retest. 5. Replace the system board and retest.
1701-xx	Fixed disk format test failed.	
1702-xx	Fixed disk read test failed.	
1703-xx	Fixed disk write/read/compare test failed.	
1704-xx	Fixed disk random seek test failed.	
1705-xx	Fixed disk controller test failed.	
1708-xx	Fixed disk format bad track test failed.	
1709-xx	Fixed disk reset controller test failed.	
1710-xx	Fixed disk park head test failed.	
1715-xx	Fixed disk head select test failed.	
1716-xx	Fixed disk conditional format test failed.	
1717-xx	Fixed disk ECC* test failed.	
1719-xx	Fixed disk drive power mode test failed.	
1736-xx	Drive Monitoring failed.	
1799-xx	Invalid fixed disk drive type failed.	

* Error Checking and Correcting

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Tape Drive Test Error Codes

The 1900 series of Diagnostic error codes identifies failures with tape cartridges, tape drives, tape drive cabling, adapter boards, or the system board assembly. Corrective action may require replacement of tape cartridges, tape drive cabling, adapter boards, tape drives, or the system board assembly.

Table 3-12
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed.	The following steps apply to error codes 1900-xx through 1906-xx: 1. Replace the tape cartridge and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the tape adapter board (if applicable) and retest. 5. Replace the tape drive and retest. 6. Replace the system board and retest.
1901-xx	Tape servo write failed.	
1902-xx	Tape format failed.	
1903-xx	Tape drive sensor test failed.	
1904-xx	Tape BOT/EOT test failed.	
1905-xx	Tape read test failed.	
1906-xx	Tape write/read/compare test failed.	

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Advanced VGA Board Test Error Codes

The 2400 series of Diagnostic error codes identifies failures with video boards, monitors, or the system board assembly. Corrective action may require replacement of a monitor, video boards, or the system board assembly.

Table 3-13
Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed.	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the System Configuration Utility. 2. Replace the monitor and retest. 3. Replace the Advanced VGA board or other video board and retest. 4. Replace the system board and retest.
2403-xx	Video attribute test failed.	
2404-xx	Video character set test failed.	
2405-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	
2406-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	
2407-xx	Video 40 x 25 mode test failed.	
2408-xx	Video 320 x 320 mode color set 0 test failed.	
2409-xx	Video 320 x 320 mode color set 1 test failed.	
2410-xx	Video 640 x 200 mode test failed.	
2411-xx	Video screen memory page test failed.	
2412-xx	Video gray scale test failed.	
2414-xx	Video white screen test failed.	
2416-xx	Video noise pattern test failed.	
2417-xx	Lightpen text mode test failed, no response.	
2418-xx	ECG/VGC memory test failed.	

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Advanced VGA Board Test Error Codes *Continued*

Error Code	Description	Recommended Action
2419-xx	ECG/VGC ROM checksum test failed.	
2420-xx	ECG/VGC attribute test failed.	
2421-xx 2422-xx	ECG/VGC 640 x 200 graphics mode test failed.	
2423-xx	ECG/VGC 640 x 350 16-color set test failed.	
2424-xx	ECG/VGC 640 x 350 64-color test failed.	
2425-xx	ECG/VGC monochrome text mode test failed.	
2431-xx 2432-xx	ECG/VGC monochrome graphics mode test failed.	
2448-xx	640 x 480 graphics test failure.	
2451-xx 2456-xx	320 x 200 graphics (256-color mode) test failure.	
2458-xx	Advanced VGA Controller test failed.	The following steps apply to error codes 2458-xx through 2480-xx: 1. Run Setup. 2. Replace the system board and retest.
2468-xx	132-column Advanced VGA test failed.	
2477-xx	Advanced VGA 256-Color test failed.	
2480-xx	Advanced VGA Bit BLT Test. Advanced VGA DAC Test. Advanced VGA Data Path Test. Advanced VGA DAC Test.	

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32-Bit DualSpeed NetFlex-2 Controller and 32-Bit DualSpeed NetFlex-2 Token Ring Controller Test Error Codes

The 6000 series of Diagnostic error codes identifies failures with 32-bit DualSpeed NetFlex-2/Token Ring Controllers. Corrective action may require replacement of the 32-bit DualSpeed NetFlex-2/Token Ring Controller.

Table 3-14
32-Bit DualSpeed NetFlex-2 Controller and 32-Bit DualSpeed NetFlex-2 Token Ring Controller Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed	The following steps apply to error codes 6000-xx through 6089-xx: 1. Check the controller installation in the EISA slot. 2. Check the interrupt type and number setting. 3. Check the media connection at the controller and Multistation Access Unit (MAU). 4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings. 5. Check the MAU, cabling, or other network components. 6. Replace the controller.
6001-xx	Network card setup failed	
6002-xx	Network card transmit failed	
6014-xx	Network card Configuration failed	
6016-xx	Network card Reset failed	
6028-xx	Network card Internal failed	
6029-xx	Network card External failed	
6089-xx	Network card Open failed	

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Compaq Network Interface Cards Test Error Codes

The 6000 series of Diagnostic error codes identifies failures with 32-bit DualSpeed NetFlex-2/Token Ring Controllers. Corrective action may require replacement of the 32-bit DualSpeed NetFlex-2/Token Ring Controller.

Table 3-15
Compaq Network Interface Cards
Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed.	The following steps apply to error codes 6000-xx through 6092-xx: 1. Check the controller installation in the EISA slot. 2. Check the interrupt type and number setting. 3. Check the media connection at the controller and Multistation Access Unit (MAU). 4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings. 5. Check the MAU, cabling, or other network components. 6. Replace the controller.
6001-xx	Network card setup failed.	
6002-xx	Network card transmit failed.	
6014-xx	Network card configuration failed.	
6016-xx	Network card reset failed.	
6028-xx	Network card internal failed.	
6029-xx	Network card external failed.	
6089-xx	Network card open failed.	
6090-xx	Network card initialization failed.	
6091-xx	Network card internal loopback failed.	
6092-xx	Network card external loopback failed.	

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SCSI Fixed Disk Drive Test Error Codes

The 6500 series of Diagnostic error codes identifies failures with SCSI fixed disk drives, SCSI fixed disk drive controller boards, SCSI fixed disk drive cabling, and system board functions. Corrective action may require replacement of fixed disk drive cables, fixed disk drive controllers, fixed disks, or the system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-16
SCSI Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
6500-xx	SCSI Disk ID drive types test failed.	The following steps apply to error codes 6500-xx through 6528-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the SCSI disk drive signal and power cables and retest. 3. Replace the SCSI controller and retest. 4. Replace the SCSI disk drive and retest. 5. Replace the system board and retest.
6502-xx	SCSI Disk Unconditional Format test failed.	
6505-xx		
6506-xx	SCSI Disk Read Test Failed.	
6509-xx	SCSI Disk SA/Media test failed.	
6523-xx	SCSI Disk Erase tape test failed.	
6528-xx	SCSI Disk Random Read test failed. Media load/unload test failed.	

SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of Diagnostic error codes identifies failures with the CD-ROM cabling, CD-ROM drives, adapter boards, or the system board assembly. Corrective action may require replacement of the CD-ROM cabling, a CD-ROM drive, an adapter board, or the system board assembly.

Table 3-17
SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed.	The following steps apply to error codes 6600-xx through 6605-xx: 1. Replace the CD-ROM media and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the SCSI controller (if applicable) and retest. 5. Replace the CD-ROM drive and retest. 6. Replace the system board and retest.
6605-xx	CD-ROM Read failed.	

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SCSI Tape Drive Test Error Codes

The 6700 series of Diagnostic error codes identifies failures with tape cartridges, tape drives, media changers, tape drive cabling, adapter boards, or the system board assembly. Corrective action may require replacement of a tape cartridge, tape drive, media changer, tape drive cabling, adapter board, or the system board assembly.

Table 3-18
SCSI Tape Drive Test Error Codes

Error Code	Description	Recommended Action
6700-xx	SCSI Tape ID drive types test failed.	The following steps apply to error codes 6700-xx through 6728-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the SCSI Tape drive signal and power cables and retest. 3. Replace the SCSI controller and retest. 4. Replace the SCSI Tape drive and retest. 5. Replace the system board and retest.
6706-xx	SCSI Disk SA/Media test failed.	
6709-xx	SCSI Disk Erase tape test failed.	
6728-xx	Media load/unload test failed.	

Server Manager/R Board Test Error Codes

The 7000 series of Diagnostic error codes identifies failures with the Server Manager/R board. Corrective action may require replacement of the Server Manager/R board, the Integrated 2400-baud modem, voice ROM, or the battery on the Server Manager/R board.

Table 3-19
Server Manager/R Board Test Error Codes

Error Code	Description	Recommended Action
7000-11	Processor (80186 Timer).	For error codes 7000-11 through 7000-46, replace the Server Manager/R board and retest.
7000-12	Processor (80186 Registers).	
7000-13	Processor (Watch Dog Timer).	
7000-14	Processor (8570 RAM).	
7000-15	Processor (8570 RTC).	
7000-21	Memory.	
7000-22	Memory Write/Read.	
7000-23	Memory Address.	
7000-24	Memory Refresh Alert.	

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Server Manager/R Board Test Error Codes *Continued*

Error Code	Description	Recommended Action
7000-25	Memory Increment	
7000-26	Memory Random Data.	
7000-27	Memory Disturb Address.	
7000-28	Memory HBM.	
7000-33	HBM IO.	
7000-34	HBM BMIC.	
7000-35	HBM Video.	
7000-41	ser_int.	
7000-42	ser_int.	
7000-43	ser_ext.	
7000-44	ser_ext.	
7000-45	ser_ext_int.	
7000-46	ser_ext_int.	
7000-51	mdm_int.	For error codes 7000-51 through 7000-57, replace the Server Manager/R board Enhanced 2400-Baud Integrated Modem and retest.
7000-52	mdm_int.	
7000-53	mdm_ext.	
7000-54	mdm_ext.	
7000-55	mdm_ext_int.	
7000-56	mdm_ext_int.	
7000-57	mdm\c\analog.	
7000-61	Voice/DTMF Internal Loopback.	For 7000-61 and 7000-62 error codes, replace the Server Manager/R board Voice ROM.
7000-62	Voice/DTMF Internal Loopback.	
7000-78	Host ADC Measurements.	For 7000-78 and 7000-79 error codes, replace the Server Manager/R board battery.
7000-79	Battery.	

Pointing Device Interface Test Error Codes

The 8600 Diagnostic error codes identifies failures with the pointing device (mouse, trackball, etc.) or the system board assembly. Corrective action may require replacement of the pointing device or the system board assembly.

Table 3-20
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing Device Interface test failed.	The following steps apply for the 8601-xx error code: 1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

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Drive Array Advanced Diagnostics (DAAD)

Drive Array Advanced Diagnostics (DAAD) is a DOS-based tool designed to run on all Compaq products that contain a Compaq Drive Array Controller. The error messages and codes listed include all codes generated by Compaq products. Your system generates only codes applicable to your configuration and options.

The two main functions of DAAD are:

- Collecting all possible information about array controllers in the system
- Offering a list of all detected problems

NOTE: Refer to the *Drive Array Advanced Diagnostics User Guide,* found on the SmartStart CD, for complete details and procedures about this diagnostic tool.

DAAD works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file and, in severe situations, this file can be sent to Compaq for analysis. In most cases, DAAD will provide enough information to initiate problem resolution immediately.

NOTE: DAAD does not write to the drives or destroy data. It does not change or remove configuration information.

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Starting DAAD

To start DAAD:

1. Insert the DAAD diskette into drive A.

Reboot the system - OR - if you are at the DOS prompt, enter the following:

A:DAAD

NOTE: To generate a DAAD report without starting the interactive portion of the utility, enter the following at the DOS prompt:
DAAD *filename*
where *filename* is the name of the file or report.

A dialog box is displayed, indicating the version of DAAD installed. Press the **Enter** (or '**C**') key to continue, or press the **Esc** (or '**E**') key to exit without continuing.

2. If you continue, a Please Wait panel is displayed, indicating that DAAD is identifying the system parameters.

   DAAD gathers all the information it can from all of the array controllers in the system. The time it takes to gather this information depends on the size of your system.

   A second Please Wait panel may be displayed to indicate that the utility is identifying the ROM version of an array controller in the system.

CAUTION: Do not cycle the power; the utility must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

When the information gathering process is complete, the main DAAD screen is displayed.

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Table 3-21 lists DAAD diagnostic messages in alphabetical order.

Table 3-21
DAAD Diagnostic Messages

Message	Description	Recommended Action
Accelerator board not detected	Array controller did not detect a configured array accelerator board.	Install array accelerator board on array controller. If an array accelerator board is installed, check for proper seating on the array controller board. You may need to run the System Configuration Utility and disable the array accelerator board to get this message off the screen.
Accelerator error log	List of the last 32 parity errors on transfers to or from memory on the array accelerator board. Displays starting memory address, transfer count, and operation (read and write).	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity read errors: n	Number of times that read memory parity errors were detected during transfers from memory on array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity write errors: n	Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator status: Permanently disabled	Array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the System Configuration Utility.	Check the Disable Code field. Run the System Configuration Utility to reinitialize the array accelerator board.
Accelerator status: Possible data loss in cache	Possible data loss detected during power-up due to all batteries being below sufficient voltage level and no presence of the identification signatures on the array accelerator board.	There is no way to determine if dirty or bad data was in the cache and is now lost.
Accelerator status: Temporarily disabled	Array accelerator board has been temporarily disabled.	Check the Disable Code field.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Accelerator status: Unrecognized status	A status returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.
Accelerator status: Obsolete data sensed at reset	During reset initialization obsolete data was found in the cache. This was due to the drives being moved and written to by another controller.	Nothing needs to be done. The controller will either write the data to the drivers or discard the data completely. Normal operations should continue.
Accelerator status: Obsolete data was written to drives	During reset initialization obsolete data was found in the cache. The obsolete data was written to the drives, but newer data may have been overwritten.	If newer data was overwritten, you may need to restore newer data; otherwise, nothing needs to be done. Normal operations should continue.
Accelerator status: Obsolete data was discarded	During reset initialization obsolete data was found in the cache and it was discarded (not written to the drives).	Nothing needs to be done. Normal operations should continue.
Accelerator status: Dirty data detected. Unable to write dirty data to drives	At least one cache line contains dirty data that the controller has been unable to flush (write) to the drives. This problem usually occurs when there is a problem with the drive(s).	Fix the problem with the drive(s). Then the controller will be able to write the dirty data to the drives.
Accelerator status: Dirty data detected has reached limit. Cache still enabled, but writes no longer being posted	The number of cache lines containing dirty data that cannot be flushed (written) to the drives has reached a preset limit. The cache is still enabled, but writes are no loinger being posted. This problem usually occurs when there is a problem with the drive(s).	Fix the problem with the drive(s). Then the controller will be able to write the dirty data to the drives and posted write operations will be restored.
Accelerator status: Excessive ECC errors detected in at least one cache line. As a result, at least on cache line is no	At least on line in the cache is no longer in use due to excessive ECC errors detected during use of the memory associated with that cache line.	Replacement of the cache should be considered. If cache replacement is not done the remaining cache lines should continue to operate properly.

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longer in use.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Accelerator status: Data in the cache was lost due to some reason other than the battery being discharged	Data in the cache was lost, but not because of the battery being discharged.	Check to be sure that the array accelerator is properly seated. If the error continues you may need to replace the array accelerator.
Accelerator status: Cache was automatically configured during last controller reset. This can occur when cacheboard is replaced with one of a different size.	Cache board was probably replaced with one of a different size.	Nothing needs to be done. Normal operations should continue.
Accelerator status: Valid data found at reset	Valid data was found in posted write memory at reinitialization. Data will be flushed to disk.	Not an error or data loss condition. No action needs to be taken.
Accelerator status: Warranty alert	Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message.	Replace the array accelerator board.
Adapter/NVRAM ID mismatch	EISA nonvolatile RAM has an ID for a different controller from the one physically present in the slot.	Run the System Configuration Utility.
Battery pack X below reference voltage	Battery pack on the array accelerator is below the required voltage levels.	Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Battery X not fully charged	Battery is not fully charged.	If 75% of the batteries present are fully charged, the array accelerator is fully operational. If more than 75% of the batteries are **not** fully charged, allow 36 hours to recharge them.
Board not	Array controller configured for use	Attach array accelerator board to array

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attached	with array accelerator board, but one is not attached.	controller.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
NVRAM configuration present, controller not detected	EISA nonvolatile RAM has a configuration for an array controller but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.	Place the array controller in the proper slot or run the System Configuration Utility to reconfigure nonvolatile RAM to reflect the removal or new position.
Compatibility port problem detected	Compatibility port configured for this IDA controller. When DAAD was verifying this interface, a serious problem was detected.	A hardware problem has occurred; replace the IDA controller.
Configuration signature is zero	DAAD detected that nonvolatile RAM contains a configuration signature that is zero. Old versions of the System Configuration Utility could cause this.	Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.
Configuration signature mismatch	Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board.	To recognize the array accelerator board, run the System Configuration Utility.
Controller communication failure occurred	Controller communication failure occurred.	DAAD was unable to successfully issue commands to the controller in this slot.
Controller detected. NVRAM configuration not present	EISA nonvolatile RAM does not contain a configuration for this controller.	Run the System Configuration Utility to configure the nonvolatile RAM.
Controller firmware needs upgrading	Controller firmware is below the latest recommended version.	Run Options ROMPaq to upgrade the controller to the latest firmware revision.
Controller firmware needs upgrading (DAAD Error	Controller is correct, however, IDA firmware version should be greater than 1.26.	Obtain the latest firmware.

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102)		
Controller is located in special "video" slot	Controller is installed in slot for special video control signals. If controller is used in this slot, LED indicators on front panel may not function properly.	Install the controller in a different slot and run the System Configuration Utility to configure the controller and nonvolatile RAM.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Controller is not configured	Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. DAAD examines each physical drive and looks for drives that have been moved to a different drive bay.	Look for messages indicating which drives have been moved. If none appear and drive swapping did not occur, run the System Configuration Utility to configure the controller and nonvolatile RAM. **Do not** run the System Configuration Utility if you believe drive swapping has occurred.
Controller needs replacing (DAAD Error 102)	IDA firmware is less than version 0.96.	Replace the controller as soon as possible.
Controller needs replacing (DAAD Error 104)	The Intelligent Array Expansion System firmware is less than version 1.14.	Replace the controller as soon as possible.
Controller reported POST error. Error Code: x	The controller returned an error from its internal Power-On Self Tests.	Replace the controller.
Controller restarted with a signature of zero	DAAD did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
DAAD recorded errors attempting to access: X	DAAD found errors while attempting to access physical drive X, believed to be operational. Message followed by specific information about the error.	Replace the drive, or correct the condition that caused the error.
Disable command issued	Posted-writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.	Restart the system. Run the System Configuration Utility to reinitialize the array accelerator board.

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Drive (bay) X needs replacing (DAAD Error 102)	The 210-megabyte hard drive has firmware version 2.30 or 2.31.	Replace the drive.
Drive Monitoring features are unobtainable	DAAD unable to get monitor and performance data due to fatal command problem such as drive time-out, or unable to get data due to these features not supported on the controller.	Check for other errors (time-outs, etc.). If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Drive Monitoring is NOT enabled for drive bay X	The monitor and performance features have not been enabled.	Run the System Configuration Utility to initialize the monitor and performance features.
Drive time-out occurred on physical drive bay X	DAAD issued a command to a physical drive and the command was never acknowledged.	The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.
Drive (bay) X firmware needs upgrading	Firmware on this physical drive is below the latest recommended version.	Run the Options ROMPaq Utility to upgrade the drive firmware to the latest revision.
Drive (bay) X has invalid M&P stamp	Physical drive has invalid monitor and performance data.	Run the System Configuration Utility to properly initialize this drive.
Drive X indicates position Y	Message indicates which physical drive appears to be scrambled or in a drive bay other than the one for which it was originally configured.	Examine the graphical drive representation on DAAD to determine proper drive locations. Remove drive X and place it in drive position Y. Rearrange the drives according to the DAAD instructions.
Drive (bay) X RIS copy mismatch	The copies of the RIS on this drive do not match.	This drive may need to be replaced. Check for other errors.
Drive (bay) X upload code not readable	An error occurred while DAAD was trying to read the upload code information from this drive.	If there were multiple errors, this drive may need to be replaced.
Duplicate write memory error	Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. This is not a data loss situation.	Replace the array accelerator board.
Error occurred reading RIS copy from drive (bay) X	An error occurred while DAAD was trying to read the RIS from this drive.	If there were multiple errors, this drive may need to be replaced.
FYI: Drive (bay) X is non-Compaq supplied	The installed drive was not supplied by Compaq.	If problems exist with this drive, replace it with a Compaq drive.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Identify controller data did not match with NVRAM	The identify controller data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. It could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.	Check the identify controller data under the Inspect Utility. If the firmware version field is the only thing different between the controller and nonvolatile RAM data, this is not a problem. Otherwise run the System Configuration Utility.
Identify logical drive data did not match with NVRAM	The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
Insufficient adapter resources	The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild may be occurring.	Operate the system without the array accelerator board until the drive rebuild completes.
Less than 75% batteries at sufficient voltage	The operation of the array accelerator board has been disabled due to less than 75% of the battery packs being at the sufficient voltage level.	Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the array accelerator board.
Logical drive X failed due to cache error	This logical drive failed due to a catastrophic cache error.	Replace the array accelerator board and reconfigure using the System Configuration Utility.
Logical Drive X status = FAILED	This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status will occur. If mirroring is enabled, and any two mirrored drives fail, this status will occur. If Data Guarding is enabled, and two or more drives fail in this unit, this	Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s) and then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.

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	status will occur. This status may also occur if another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state.

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Logical Drive X status = INTERIM RECOVERY	A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable.	Replace the failed drive as soon as possible.
Logical Drive X status = LOOSE CABLE DETECTED	A physical drive has a cabling problem.	Turn the system off and attempt to reattach the cable onto the drive. If this does not work, replace the cable.
Logical Drive X status = NEEDS RECOVER	A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.	When booting up the system, select the "F1 - rebuild drive" option to rebuild the replaced drive.
Logical Drive X status = OVERHEATED	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels and it has shut down to avoid damage.	Check the fans and the operating environment.
Logical Drive X status = OVERHEATING	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels.	Check the fans and the operating environment.
Logical Drive X status = RECOVERING	A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data.	Nothing needs to be done. Normal operations can occur.
Logical Drive X status = WRONG DRIVE REPLACED	A physical drive in this logical drive has failed. The incorrect drive was replaced.	Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the System Configuration Utility to reconfigure; you will lose data on the drive.
Loose cable detected - logical drives may be marked FAILED until corrected	Controller unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller.	Check all controller and drive cable connections.

Continued

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Mirror data miscompare	Data was found at reinitialization in the posted write memory; however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.	Replace the array accelerator board.
Mirrored memory location errors	Soft errors occurred when attempting to read the same data from both sides of the mirrored memory. Data loss will occur.	Replace the array accelerator board.
No configuration for Accelerator Board	The array accelerator board has not been configured.	If the array accelerator board is present, run the System Configuration Utility to configure the board, if desired.
Drive (bay) X has loose cable	The array controller could not communicate with this drive at power-up. This drive has not previously failed.	Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect data/power cable to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.
Drive (bay) X is a replacement drive	This drive has been replaced. This message displays if a drive is replaced in a fault tolerant logical volume.	If the replacement was intentional, allow the drive to rebuild.
Drive (bay) X is a replacement drive marked OK	This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when DAAD is run, the drive starts working again).	Replace the drive.
Drive (bay) X is failed	The indicated physical drive has failed.	Replace this drive.
Drive (bay) X has insufficient capacity for its configuration	Drive has insufficient capacity to be used in this logical drive configuration.	Replace this drive with a larger capacity drive.
Drive (bay) X is undergoing drive recovery	This drive is being rebuilt from the corresponding mirror or parity data.	Normal operations should occur.

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Drive (bay) X was inadvertently replaced	The physical drive was incorrectly replaced after another drive failed.	Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the System Configuration Utility and try to reconfigure; data will be lost.

Continued

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
SCSI port X, drive ID Y firmware needs upgrading	Drive's firmware may cause problems and should be upgraded.	Run Options ROMPaq to upgrade the drive's firmware to a later revision.
Set configuration command issued	The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized.	Run the System Configuration Utility to reinitialize the array accelerator board.
Soft Firmware Upgrade required	DAAD has determined that your controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.	Run the Compaq Upgrade Utility to place the latest firmware on all drives.
Threshold for drive (bay) X violated	This message indicates that a monitor and performance threshold for this drive has been violated.	Check for the particular threshold that has been violated.
Threshold violations for drive (bay) X	This is a list of the individual thresholds that have been violated for this drive.	The drive may need to be replaced. Run the Compaq Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.
Unknown disable code	A code was returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.
Warning bit detected	A monitor and performance threshold violation may have occurred. The status of a logical drive may not be OK.	Check the other error messages for an indication of the problem.

Continued

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DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
WARNING - Drive Write Cache is enabled on X	Drive has its internal write cache enabled. The drive may be a third-party drive or the drive's operating parameters may have been altered. Condition may cause data corruption if power to the drive is interrupted.	Replace the drive with a Compaq supplied drive, or restore the drive's operating parameters.
Wrong Accelerator	This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by DAAD and a message indicating the type of adapter last configured in EISA nonvolatile RAM.	Check the diagnosis screen for other error messages. Run the System Configuration Utility to update the system configuration.

Integrated Management Log

On servers supporting the Integrated Management Display, Compaq Integrated Management Log (IML) replaces the Critical Error Log and Correctable Memory Logs. It records system events and stores them in an easily viewable form. It marks each event with a time-stamp with one-minute granularity.

Events listed in the Integrated Management Log are categorized as one of four event severity levels:

- Status - indicates that the message is informational only.
- Repaired - indicates that corrective action has been taken.
- Caution - indicates a non-fatal error condition.
- Critical - indicates a component failure.

The Integrated Management Log requires Compaq Operating System-dependent drivers. Refer to the Compaq Support Software CD for instructions on installing the appropriate drivers.

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Multiple Ways of Viewing the Log

You can view an event in the IML in several ways:

- On the Integrated Management Display
- From within Compaq Insight Manager
- From within Compaq Survey Utility
- From within IML Management Utility

Integrated Management Display

The Integrated Management Display is a Liquid Crystal Display (LCD) panel that presents information directly at the server, assisting in diagnosing and servicing the server without a keyboard and monitor.

Compaq Insight Manager

Compaq Insight Manager is a server management tool providing in-depth fault configuration and performance monitoring of hundreds of Compaq servers from a single management console. System parameters that are monitored describe the status of all key server components. By being able to view the events that may occur to these components, you can take immediate action. You can view and print the event list from within Compaq Insight Manager by following the instructions below. You can also mark a critical or caution event as repaired after the affected component has been replaced. For example, when a fan that has failed has been replaced. By marking as repaired, you can lower the severity of the event.

Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server, then select View Device Data. The selected server is displayed with buttons around its perimeter.
2. Select the Recovery button.
3. Select Integrated Management Log.
4. If a failed component has been replaced, select the event from the list, then select Mark Repaired.

Printing the Event List

NOTE: You can only view the list from the Recovery/Integrated Management Log screen as described above.

1. From the Insight Manager, select the appropriate server.
2. Select the Configuration button.
3. Select the Recovery button.
4. Select Print.

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Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available from Windows NT and Novell NetWare that delivers online-configuration capture and comparison to maximize server availability. It is delivered on the Compaq Management CD in the SmartStart package or is available on the Compaq website. Refer to the Compaq Management CD for information on installing and running the Compaq Survey Utility.

After running the Compaq Survey Utility, you can view the IML by loading the output of the utility (typically called "survey.txt") into a text viewer such as Notepad. The event list follows the system slot information. Once you have opened the text file, you can print it using the print feature of the viewer.

Compaq IML Management Utility

The Compaq IML Management Utility is a DOS-based tool that gives you the off-line ability to review, mark corrected, and print events from the IML. It is located on the Compaq SmartStart and Support Software CD. Refer to the *SmartStart Installation for Servers* poster, which ships with the server, for information on how to install and use the IML Management Utility.

List of Events

The event list displays the affected components and the associated error messages. Though the same basic information is displayed, the format of the list may be different, depending on how you are viewing it: on the Integrated Management Display, from within Compaq Insight Manager, the IML management utility, or from within the Compaq Survey Utility. An example of the format of an event as displayed on the Integrated Management Display is as follows:

```
**001 of 010**
---caution---
03/19/1997
12:54 PM
FAN INSERTED
Main System
Location:
  System Board
Fan ID: 03
**END OF EVENT**
```

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Table 3-22
Event Messages

Event Type	Event Message
Machine Environment	
Fan Failure	System Fan Failure (Fan X, Location)
Fan Inserted	System Fan Inserted (Fan X, Location)
Fan Removed	System Fan Removed (Fan X, Location)
Fans Not Redundant	System Fans Not Redundant
Overheat Condition	System Overheating (Zone X, Location)
Main Memory	
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X)
	Corrected Memory Error threshold passed (System Memory)
Uncorrectable Error	Corrected Memory Error threshold passed (Memory Module unknown)
	Uncorrectable Memory Error (Slot X, Memory Module X)
	Uncorrectable Memory Error (System Memory)
	Uncorrectable Memory Error (Memory Module unknown)
Processor	
Correctable Error Threshold exceeded	Processor Correctable error Threshold passed (Slot X, Socket X)
Uncorrectable Error	Processor Uncorrectable internal error (Slot X, Socket X)
Host Bus Error	Unrecoverable Host Bus Data Parity Error
	Unrecoverable Host Bus Address Parity Error
EISA Bus	EISA Expansion Bus Master Timeout (Slot X)
	EISA Expansion Bus Slave Timeout
	EISA Expansion Board Error (Slot X)
	EISA Expansion Bus Arbitration Error

Continued

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Event Messages *Continued*

Event Type	Event Message
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X)
Power Subsystem	
Power Supply Failure	System Power Supply Failure (Power Supply X)
Power Supply Inserted	System Power Supply Inserted (Power Supply X)
Power Supply Removed	System Power Supply Removed (Power Supply X)
Power Supply Not Redundant	System Power Supplies Hot Redundant
	Real-Time Clock Battery Failing
System Configuration Battery Low	A CPU Power Module (System Board, Socket X)
Power Module Failure	A CPU Power Module (Slot X, Socket X)
	System Power Modules Not Redundant
Power Modules Not Redundant	System AC Power Problem (Power Supply X)
	System AC Power Overload (Power Supply X)
AC Voltage Problem	
Power AC Overload	
Automatic Server Recovery	
System Lockup	ASR Lockup Detected: Cause
Operating System	
System Crash	Blue Screen Trap: Cause [NT]
	Kernel Panic: Cause [UNIX]
	Abnormal Program Termination: Cause [NetWare]
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure
	Automatic Operating System Shutdown Initiated Due to Overheat Condition
	Fatal Exception (Number X, Cause)

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Rapid Recovery Services

Compaq servers provide rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery.

Rapid recovery means fast identification and resolution of complex faults. The Rapid Recovery Engine and Insight Management Agents notify the system administrator when a failure occurs, ensuring that the server experiences minimal downtime. You enable these features through the System Configuration Utility. These integrated server management features are:

- Automatic Server Recovery-2 (ASR-2)
- Server Health Logs (on servers not supporting Integrated Management Logs)
- Storage Fault Recovery Tracking
- Storage Automatic Reconstruction
- Network Interface Fault Recovery Tracking
- Memory Fault Recovery Tracking (with option upgrade kit)

These are discussed in more detail on the Systems Reference Library CD (SRL).

Automatic Server Recovery-2

Automatic Server Recovery-2 (ASR-2) lets the server restart automatically from the operating system or the Compaq Utilities. To use this feature, you must use the System Configuration Utility to install Compaq Utilities in the system partition.

You can tell ASR-2 to restart your server after a critical hardware or software error occurs. Using the Compaq System Configuration Utility, configure the system for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

You can also configure ASR-2 to page an administrator when the system restarts. ASR-2 depends on the application and driver that routinely notify the ASR-2 hardware of proper system operations. If the time between ASR-2 notifications exceeds the specified period, ASR-2 assumes a fault has occurred and initiates the recovery process.

To configure ASR-2:

1. Execute the System Configuration Utility.
2. Select *View and Edit Details*.
3. Set the software error recovery status to Enabled.
4. Set the software error recovery time-out.

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The available recovery features are:

- **Software Error Recovery** – automatically restarts the server after a software-induced server failure
- **Environmental Recovery** – allows the server to restart when temperature, fan, or AC power conditions return to normal

Unattended Recovery

For unattended recovery, ASR-2 performs the following actions:

- Logs the error information to the IML
- Resets the server
- Pages you (if a modem is present and you selected paging)
- Tries to restart the operating system. Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available.

ASR-2 tries to restart the server up to 10 times. If ASR-2 cannot restart the server within 10 attempts, it places a critical error in the Integrated Management Log, starts the server into Compaq Utilities, and enables remote access (if you configured remote access).

To use this level of ASR-2, you must configure ASR-2 to load the operating system after restart.

Attended Recovery

For attended recovery, ASR-2 performs the following actions:

- Logs the error information to the IML
- Resets the server
- Pages you (if a modem is present and you selected Paging)
- Starts Compaq Utilities from the hard drive
- Enables remote access

During system configuration, these utilities are placed on the system utilities partition of the hard drive.

If you have configured for dial-in access and have a modem with an auto-answer feature installed, you can dial in and remotely diagnose or reconfigure the server.

If you have configured the Compaq Utilities for network access, you can access the utilities over the network. You can use Compaq Insight Manager for dial-in or network access.

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Hardware Requirements

To use this level of ASR-2 over a modem, you need the following:

- Compaq modem or optional Hayes modem
- System Configuration Utility and Diagnostics Utility installed on the system partition of the hard drive
- ASR-2 configured to load Compaq Utilities after restart

You can also run Compaq Utilities remotely over an IPX or IP network using the Network feature:

- To use Compaq Utilities on an IPX network, you must have Compaq Insight Manager 2.0 or later or an NVT (Novell Virtual Terminal) Terminal Emulator with VT100 or ANSI terminal capabilities.
- To use Compaq Utilities on an IP network, you must have Compaq Insight Manager 2.10 or later, or a Telnet Terminal Emulator with VT100 or ANSI capabilities.

If you are notified that ASR-2 restarted the server and you have restarted to Compaq Utilities, use the Inspect Utility or Compaq Insight Manager to view the critical error in the Critical Error Log. Run Diagnostics to diagnose and resolve the problem.

You can configure ASR-2 to restart the server into Compaq Utilities to diagnose the critical error, or to start the operating system to return the server to operational status as rapidly as possible.

When you enable ASR-2 to start the operating system, the server tries to start from the primary partition. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access Compaq Utilities.

When you enable ASR-2 to start Compaq Utilities, your server restarts after a critical error and loads Compaq Utilities from the system partition on the hard drive.

You can configure your server to start Compaq Utilities in four different ways:

- Without remote console support; for example, to run Compaq Utilities from the server console only
- With remote console support using modems for dial-in access
- With remote console support using a modem to dial a predetermined telephone number
- With remote console support through a network connection (IP or IPX)

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Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities. Some of the console's features include

- Accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server reboot
- Provides access to system configuration
- Uses out-of-band communication with dedicated management modem installed in the server

For more information, see the *Integrated Remote Console User Guide*,that shipped with your server.

IMPORTANT: Before configuring ASR-2, verify that the System Configuration Utility and Diagnostics software are installed on the system partition. ASR-2 must have this to start Compaq Utilities after a system restart. Compaq recommends this even if you configure ASR-2 to start the operating system.

Compaq Health Driver

The Compaq Health Driver continually resets the ASR-2 timer according to the frequency you specified in the System Configuration Utility (for example, 10 minutes). If the ASR-2 timer counts down to zero before being reset, due to an operating system crash or a server lock-up, ASR-2 restarts the server into either Compaq Utilities or the operating system (as indicated by the System Configuration parameters). The default value is 10 minutes. The allowable settings are 5, 10, 20, and 30 minutes.

For remote and off-site (unattended) servers, setting the software error recovery time-out for 5 minutes reduces the server downtime and allows the server to recover quickly. For local (attended) servers located onsite, you can set the software error recovery time-out for 20 or 30 minutes, giving you time to arrive at the server if you wish to manually diagnose the problem.

The Compaq Health Driver is independent of the ASR-2 timer. You should load it enabling the ASR-2 timer. This allows the driver to detect and log information about numerous hardware and software errors in the IML. However, you cannot enable the ASR-2 timer without loading the Compaq Health Driver.

Before ASR-2 restarts the server, it will record any information available about the condition of the operating system in the Critical Error Log, or the IML depending on the server support. This information can be used to diagnose an operating system crash or server lock-up, while still allowing the server to be restarted.

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The following ASR-2 flow chart shows you the sequence of events after a hardware or software error occurs:

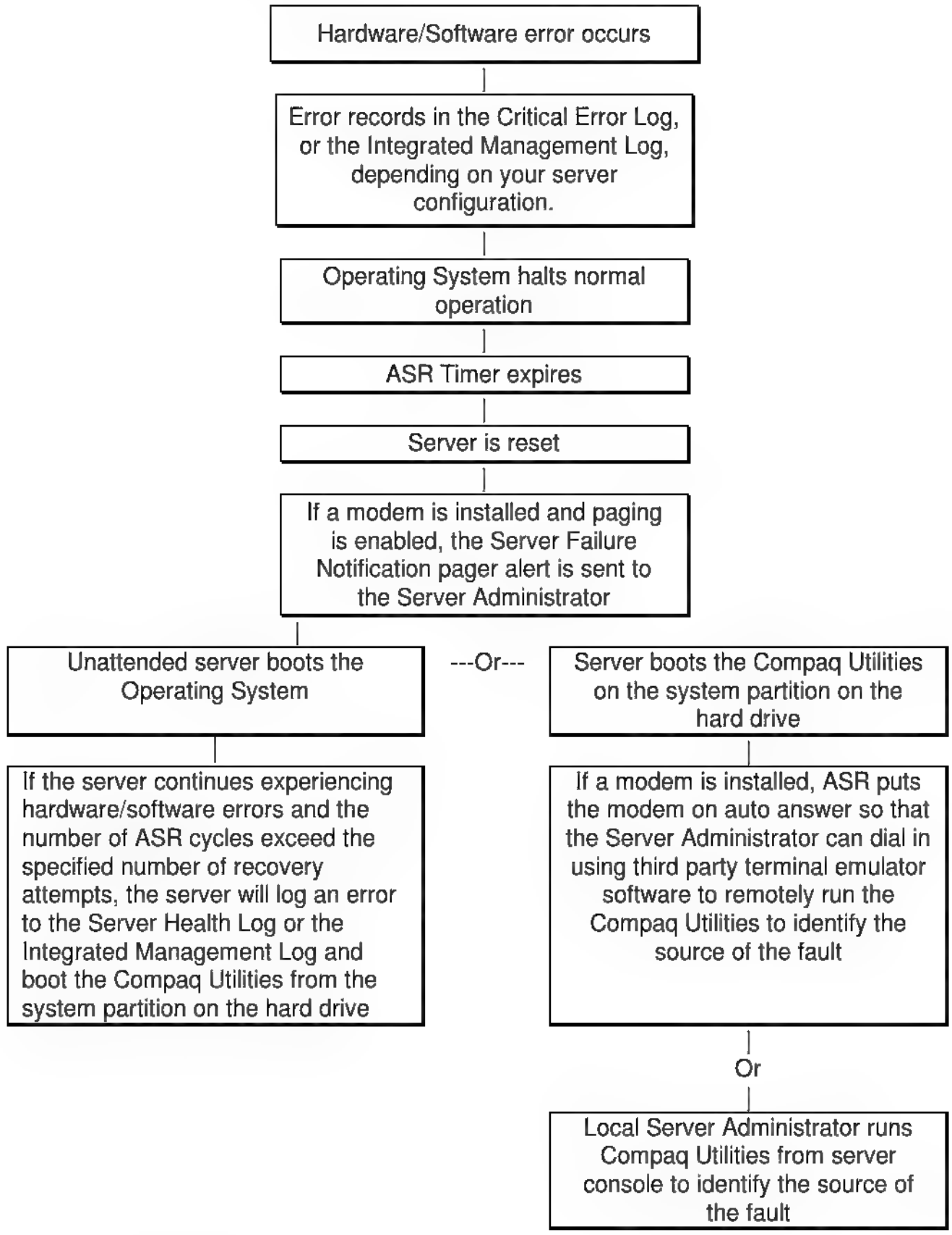
Hardware/Software error occurs
Error records in the Critical Error Log, or the Integrated Management Log, depending on your server configuration.
Operating System halts normal operation
ASR Timer expires
Server is reset
If a modem is installed and paging is enabled, the Server Failure Notification pager alert is sent to the Server Administrator
Unattended server boots the Operating System
---Or---
Server boots the Compaq Utilities on the system partition on the hard drive
If the server continues experiencing hardware/software errors and the number of ASR cycles exceed the specified number of recovery attempts, the server will log an error to the Server Health Log or the Integrated Management Log and boot the Compaq Utilities from the system partition on the hard drive
If a modem is installed, ASR puts the modem on auto answer so that the Server Administrator can dial in using third party terminal emulator software to remotely run the Compaq Utilities to identify the source of the fault
Or
Local Server Administrator runs Compaq Utilities from server console to identify the source of the fault

Figure 3-1. ASR-2 flow chart

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Booting into Compaq Utilities

When you enable ASR-2 to start into Compaq Utilities and a critical error occurs, the operating-system-specific Health Driver logs the error information in the Critical Error Log or the IML and the ASR-2 feature restarts the server. When the system reinitializes, the system pages the designated administrator (if enabled), and starts Compaq Utilities from the hard drive.

If Dial-In status is enabled, the modem is placed in auto-answer mode. If you enable Dial-Out status, you are automatically enabled for Dial-In.

If Network Status is enabled, the appropriate network support software is loaded, depending on the network protocol, IP or IPX. This allows remote access via the network.

IMPORTANT: Compaq Utilities are loaded from a specially created system partition on the hard drive. This partition was configured during server configuration.

You can access the server and view the Server Health Logs (in servers not supporting the IML) remotely by modem, in-band over the network, or directly from the server. For modem access, you must have either Compaq Insight Manager 2.0 or above or have a VT100 or ANSI terminal type device. You may use a standard CRT with VT100 or ANSI emulation capability, or you may use a PC with a VT100 or ANSI terminal emulation package. The communication parameters must be set for 8 data bits, no parity, and 1 stop bit.

You can also enable ASR-2 to allow network access using the Network Status feature in the System Configuration Utility. You must have either Compaq Insight Manager 2.0 or greater or a Novell Virtual Terminal (NVT) emulator on an IPX network to use this feature. You must also have version 2.24 or later of the System Configuration Utility. For IP access, you must have either Compaq Insight Manager 2.10 or later, or a Telnet Terminal emulator to use this feature. You also must have version 2.24 or later of the System Configuration Utility.

The System Configuration Utility settings should resemble the settings in the following table when you enable ASR-2 to start into Compaq Utilities.

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Table 3-23
Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities

Pager Data	Setting	Description
Pager status	Enabled	Indicates if the pager feature is enabled or disabled.
Pager dial string	ATDT 555-5555	Indicates the pager dial string and delay before the pager message. Pagers typically use one of the following formats: Local pagers: ATDT 555-5555 Wide area pagers: ATDT 1-800-555-5555,1234567#
Pager message	1234567#	Represents a unique number (maximum seven digits, numeric only) that you must designate to identify the server on your pager display. The ROM adds a three-digit code to the front of this number. The first two indicate the subsystem and the third indicates the severity of the error that caused the alert. The # symbol usually terminates the message. If no message is required, delete the # symbol.
Pager test	Select to test pager setup	Use this to test the current pager settings. Press Enter to dial the pager number, and the pager message (if present) displays. You must configure the computer before testing the pager and the Pager Status must be set to Enabled. Do not test the pager if you are running remotely and are using only one modem.
Serial interface	COM1	Select the communications port for the modem used by the pager and the remote ASR-2 functions. The options are COM1 and COM2.
Dial-in status	Enabled	Set Dial-In Status to Enabled. Be sure the Reset Boot option is set to Boot Compaq Utilities. When the system starts because of an ASR reset, it starts to the Compaq Utilities, sets the Management Modem to auto-answer, and waits for the administrator to dial in and run the Compaq Utilities. You automatically disable this option when you configure the software error recovery start option to Boot Operating System. When ASR pages you, you cannot dial in unless ASR-2 exceeds 10, the threshold number of server restart retries. When this happens, ASR-2 restarts the server into the Compaq Utilities and places the modem in auto-answer mode.

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Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities *Continued*

Pager Data	Setting	Description
Dial-out status	Enabled	Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial In Status is automatically selected. To use the dial-out feature, set Dial-Out Status to Enabled and set the Dial-Out String to the correct phone number. You must also set the Reset Boot option to Boot Compaq Utilities. When the system restarts because of an ASR reset, the administrator is paged via Pager Status and Pager Dial String, the system restarts to the Compaq Utilities, and dials out to the phone number provided in the Dial-Out string. The dial-out number will be tried five times. If it fails to connect after five attempts, the modem is put in auto-answer mode.
Dial-out string	555-1234	Enter the dial string followed by the remote computer telephone number.
Network status	Enabled	To allow network access to Compaq Utilities, set Network Status to Enabled and make sure the Reset Boot option is set to Boot Compaq Utilities.
Network protocol		To use IPX network access, set Network Protocol to IPX. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IPX network support. This enables remote access via NVT. To use IP network access, set Network protocol to IP. Also make sure to set Network IP address, Network IP net mask, and Network IP router address. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IP network support. This enables remote access via Telnet. **NOTE:** The Network Status must be set to Enabled for network access.
Network controller	Compaq	For all Compaq Standard Network Controllers.
Network host name	CPQHOU	Enter the network name of the server. Use underscores instead of spaces within the name, for example, Compaq_Server. If you are using IPX network access to the Compaq Utilities, this server name is used to advertise NVT host services. This server name displays in the Compaq Insight Manager server list when it determines it can communicate via NVT. Set this name to be the same as the server name you assign when the host OS is running.
Network card slot	Slot #	Select the slot number of the network interface card you wish to use for network access to Compaq Utilities.
Network frame type	ETHERNET_II	Select the frame type for your network. Selections include both Ethernet and Token Ring topologies.

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Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities *Continued*

Pager Data	Setting	Description
Network IP address		Enter the IP address for this server in standard dot notation. **NOTE:** This is not used if you select Custom for Network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP net mask		Enter the net mask for this server in standard dot notation. **NOTE:** This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP router address		Enter the router to be used for this server in standard dot notation. **NOTE:** This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.

If you configure the server to boot into Compaq Utilities, it prepares for remote communications. You can remotely run Diagnostics software, Inspect Utility, or System Configuration Utility using a workstation running terminal emulation software, such as Compaq Insight Manager or PC Anywhere.

Booting into the Operating System

When you enable ASR-2 to restart into the operating system and a critical error occurs, ASR-2 logs the error in the Critical Error Log or IML and restarts the server. The system ROM pages the designated administrator, and executes the normal restart process.

IMPORTANT: When you enable ASR-2 to restart into the operating system, Modem Dial-In Status, Network Status, and Modem Dial-Out Status are automatically disabled. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access the server, and the server cannot dial out to a remote workstation.

During the recovery process, the ASR-2 feature tries to restart the server up to 10 times. If the ASR-2 feature cannot restart the server within 10 attempts, it logs a critical error in the Critical Error Log or IML Log restarts the server into the Compaq Utilities, and puts the modem into auto-answer mode.

Your System Configuration Utility setting should resemble the following when you enable ASR to restart into the operating system:

- Serial interface — COM1
- Dial-in status — Disabled
- Dial-out status — Disabled
- Dial-out string — 555-1234
- Network status — Disabled

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■ Network protocol	IPX
■ Network controller	Compaq
■ Network host name	CPQHOU
■ Network card slot	Slot #
■ Network frame type	ETHERNET_II
■ Network IP address	xxx.xxx.xxx.xxx
■ Network IP net mask	xxx.xxx.xxx.xxx
■ Network IP router address	xxx.xxx.xxx.xxx

ASR-2 Security

The standard Compaq password features function differently during ASR-2 than during a typical system startup.

During ASR-2, the system does not prompt for the Power-On Password. This allows the ASR-2 to restart the operating system or Compaq Utilities without user intervention.

To maintain system security, set the server to boot in Network Server Mode (an option in the System Configuration Utility). This option ensures that the server keyboard is locked until you enter the Keyboard Password.

Select an Administrator Password (an option in the System Configuration Utility). During attended ASR-2 (local or remote), you must enter this Administrator Password before any modifications can be made to the server configuration.

Server Health Logs

In some servers, Server Health Logs are replaced by the IML, if it is supported. See "Integrated Management Display" in this chapter for more information.

The Server Health Logs contain information to help identify and correct any server failures and correlate hardware changes with server failure. The Server Health Logs are stored in nonvolatile RAM and consist of the Critical Error Log and the Revision History Table.

If errors occur, information about the errors is automatically stored in the Critical Error Log.

Whenever boards or components (that support revision tracking) are updated to a new revision, the Revision History Table will be updated.

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Critical Error Log

The Critical Error Log records memory errors, as well as catastrophic hardware and software errors that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the Critical Error Log through the Compaq Insight Manager. The Diagnostics Utility either resolves the error or suggests corrective action in systems that do not support event logs.

The Critical Error Log identifies and records all the following errors. Each error type is briefly explained below.

Table 3-24
Critical Error Log Messages

Message	Description
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery-2 (ASR-2) timer expiration.
Automatic Server Recovery Extended Memory Parity Error	The system detected a data error in extended memory following a reset due to the ASR-2 timer expiration.
Automatic Server Recovery Memory Parity Error	The system ROM was unable to allocate enough memory to create a stack. Then, it was unable to put a message on the screen or continue booting the server.
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to ASR-2 timer expiration has been reached, resulting in the loading of Compaq Utilities.
Battery Failing	Low system battery warning. Replace battery within 7 days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the system's nonvolatile RAM is imminent.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Diagnostic Error	An error was detected by the Diagnostics Utility. See the specific error code in this chapter for a detailed explanation.

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Error Detected On Boot Up	The server detected an error during the Power-On Self-Test (POST).
Processor Prefailure	A CPU has passed an internal corrected error threshold; excessive internal ECC cache errors .

Continued

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Critical Error Log Messages *Continued*

Message	Description
NMI - PCI Bus Parity Error	A parity error was detected on the PCI bus.
NMI - Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a server failure.
NMI - Expansion Bus Master Time-Out	A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure.
NMI - Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure.
NMI - Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a server failure.
Processor Exception	The indicated processor exception occurred.
NMI - Processor Parity Error	The processor detected a data error, resulting in a server failure.
Server Manager Failure	An error occurred with the Server Manager/R.
NMI - Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a server failure.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
NMI- Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR-2 timer expiration.
Required System Fan Failure	The required system fan has failed. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
UPS A/C Line Failure Shutdown or Battery Low	The UPS notified the operating system that the AC power line has failed. Accompanying data indicates if an auto-shutdown sequence has been invoked or if the battery has been nearly depleted.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.

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Revision History Table

Some errors can be resolved by reviewing changes to the server configuration. The server has an Automatic Revision Tracking (ART) feature that helps you review recent changes to the server configuration.

One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other system boards providing ART-compatible revision information. This feature lets you determine the level of functionality of an assembly in a system without opening or powering down the unit.

Table 3-25
Revision History Format

Current Revisions	
Date	10/31/95
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A
Previous Revisions	
Date	03
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A

The Revision History Table is stored in nonvolatile RAM and is accessed through Inspect Utility and Compaq Insight Manager.

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Storage Fault Recovery Tracking

This feature tracks over 12 failure-indication parameters, such as time-outs, spin-up, and self-test errors of SCSI drives. You can use these parameters to pinpoint failed storage subsystem components and to recover from controller or hard drive failure.

Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure your server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation if a drive fails.

Network Interface Fault Recovery Tracking

This feature tracks over 20 failure indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and Token Ring network interfaces. It decreases network downtime by enabling diagnosis of actual network interface failures.

Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for uncorrectable memory errors.

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Remote Service Features

Compaq servers have the following management features that you can access by modem or network:

Table 3-26
Compaq Servers Remote Management Features

Feature	Description
Service Session	Provides remote access to all the utilities on the system partition, including Diagnostics utilities, Inspect, ROMPaq, Drive Array Advanced Diagnostics (DAAD), and the System Configuration Utility. Also provides the capability for remote file transfer services to and from the system partition.
Disk-Based Diagnostics	Provides remote diagnostic capability after you configure ASR-2 and the reset restart option to restart from Compaq Utilities. Also allows you to view Health Logs. Disk-based diagnostics can also be run locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Server Restart	Provides the ability to restart the server remotely from Compaq Insight Manager while the operating system is running. Allows the server to restart back to the operating system or restart to the system partition. Provides a complete system reset to all peripherals. If you select Boot to Compaq Utilities from Compaq Insight Manager, Compaq Utilities loads the appropriate remote services so that remote access is available. If network status is enabled, network support is loaded. If Dial-In status is enabled, the modem is set to auto-answer.
Configuration Utility	Allows you to run the System Configuration Utility remotely. You can also run the remote configuration utility locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Firmware Updates	Allows you to update the server firmware remotely. Uses firmware images on the system partition that might have been previously uploaded with the file transfer services.

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ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the ROM:

- Run the ROMPaq utility from the system partition, or
- Insert a ROMPaq diskette into drive A and cold boot the system.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

> **CAUTION:** Do not turn the power off during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from booting.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your servers.

Features of Compaq Insight Management

Compaq Insight Management features include:

- Comprehensive Fault Management - For all major subsystems, including pre-failure alerting for disks, memory, and Pentium II processors.
- Integration Management - In conjunction with SmartStart, allows you to effectively deploy and manage configurations throughout the enterprise using the Integration Server and Insight Version Control.
- Performance Management - Sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more.
- Workstation Management - Monitors and manages Compaq Professional Workstations.
- Client Management - Manages faults and assets on Compaq Deskpro computers.
- Netelligent Management - Receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software.

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- Asset Management - Exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications.
- Remote Management - Manages in-band or out-of-band devices, online or offline, from any location.
- Reporting - Using Automatic Data Collection, gathers historic performance information for graphing or export purposes.
- Integration with Enterprise Management Platforms - Provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is typical of other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system's state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers monitoring functions that include temperature sensing and disk pre-failure alerting.

Insight Agents provide information to management applications such as Compaq Insight Manager, and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol or SNMP.

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the Systems Reference Library CD that accompanied your server.

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Chapter 4
Connectors, Switches, and Jumpers

This chapter provides connector, switch, and jumper information for the Compaq ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus.

Figure 4-1 depicts the connectors and slots on the rear panel of the server. Table 4-1 gives corresponding connector/slot descriptions.

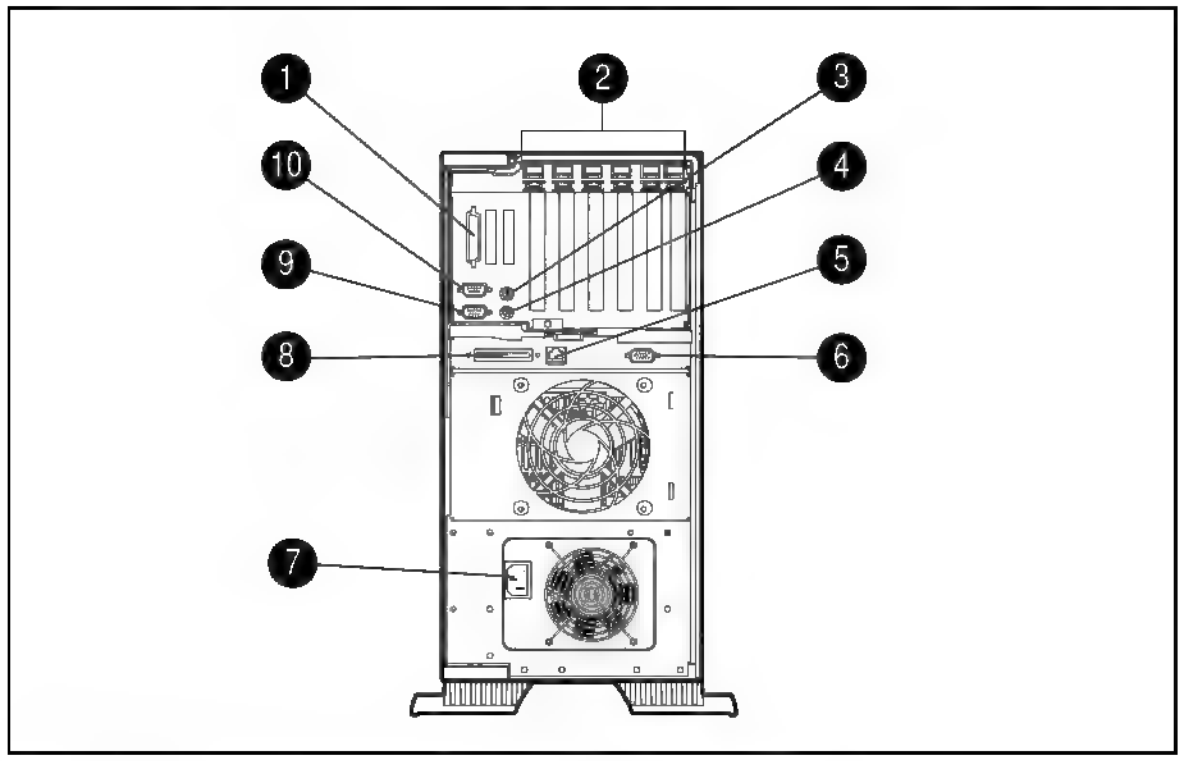

Figure 4-1. Compaq ProLiant 1600 rear panel components

Table 4-1
Compaq ProLiant 1600
Rear Panel Components

Reference	Connector/Slot	Reference	Connector/Slot
1	Parallel Connector	6	Video Connector
2	PCI/ISA Expansion Slots	7	Power Connector
3	Mouse Connector	8	External SCSI Connector (B)
4	Keyboard Connector	9	Serial Connector A
5	RJ-45 Ethernet Connector with 3 NIC LEDs: Active, Link, and 10/100 Speed	:	Serial Connector B

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Processor Board

Components

Figure 4-2 depicts the Compaq ProLiant 1600 processor board components. Table 4-2 gives the corresponding component descriptions.

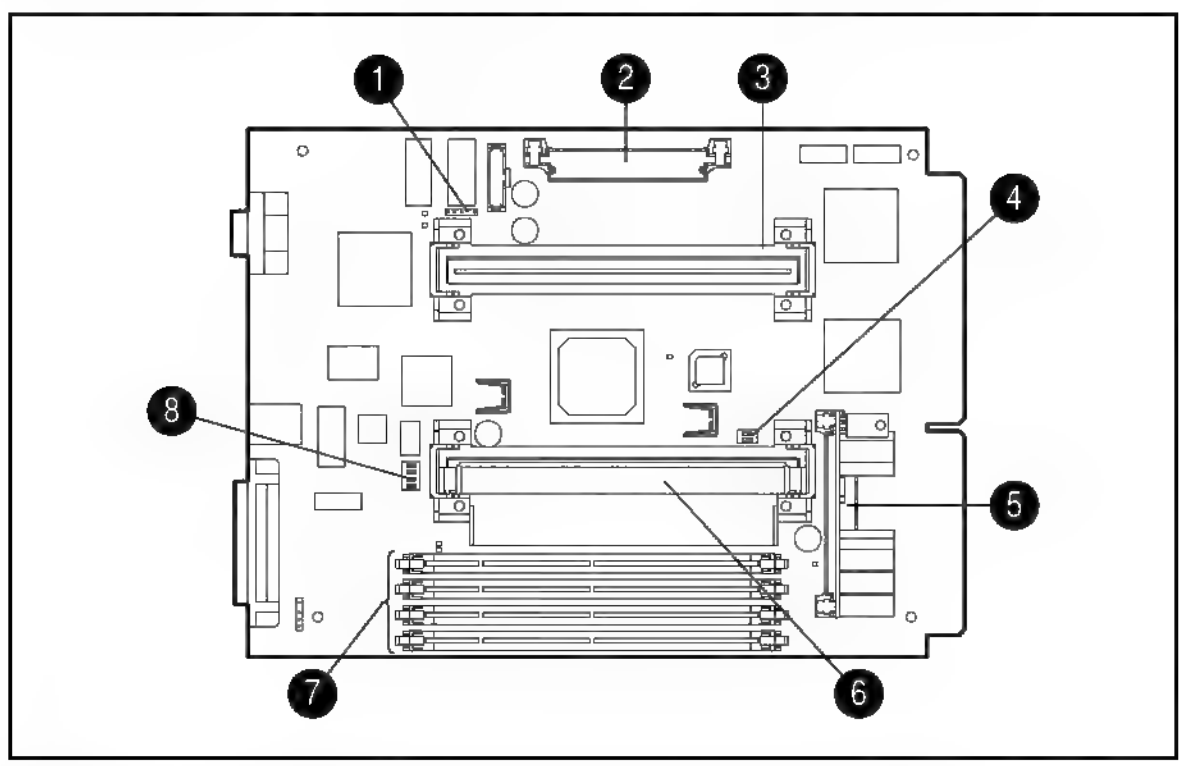

Figure 4-2. Compaq ProLiant 1600 processor board components

Table 4-2
Compaq ProLiant 1600
Processor Board Components

Reference	Component
1	Fan connector
2	Processor 2 Power Module Socket
3	Processor 2 Socket
4	Reserved Switch SW2
5	Processor I Power Module (Installed)
6	Processor 1 Socket
7	SDRAM DIMM slots 1 - 4
8	Bus Ratio Switch, SW1

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External Connectors and LEDs

Figure 4-3 depicts the Compaq ProLiant 1600 processor board external connectors and LEDs. Table 4-3 gives the corresponding connector and LED descriptions.

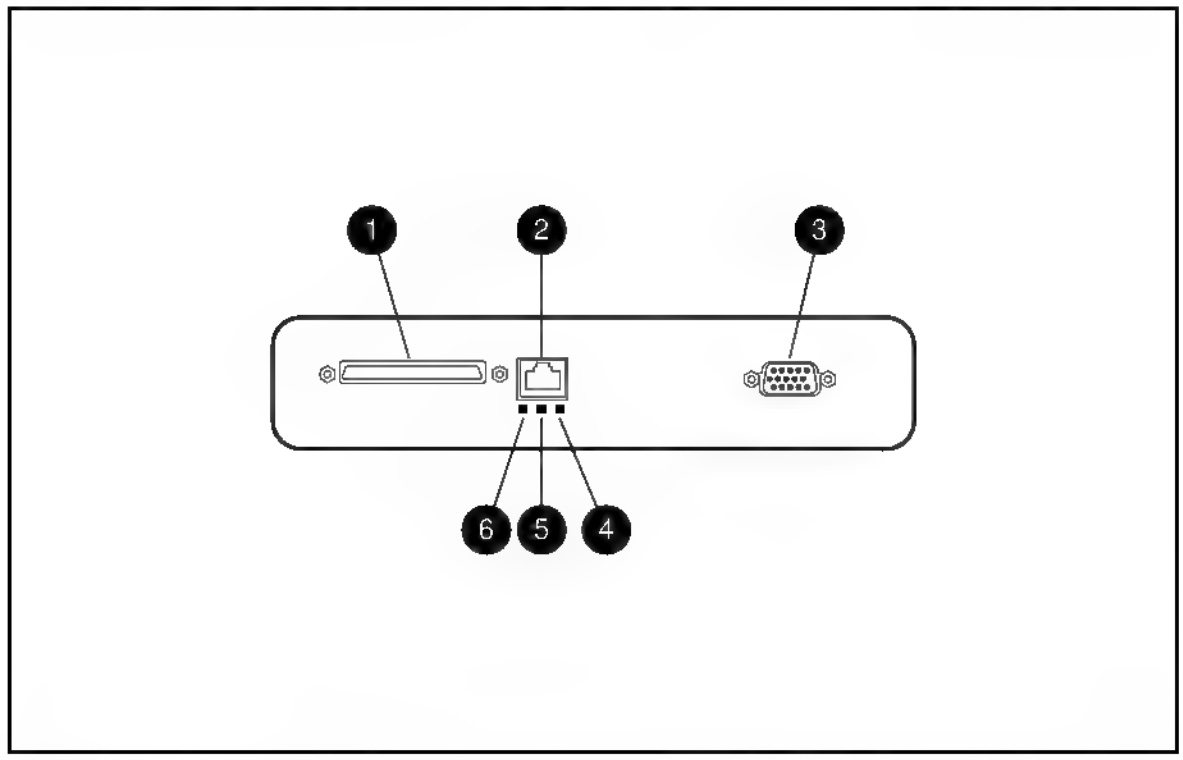

Figure 4-3. Compaq ProLiant 1600 processor board external connectors and LEDs

Table 4-3
Compaq ProLiant 1600
Processor Board External Connectors and LEDs

Reference	Connector/LED
1	SCSI External Bus B connector
2	RJ-45 connector
3	Video connector
4	NIC Active LED
5	NIC 10/100 Speed LED
6	NIC Link LED

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Bus Settings

The bus/core frequency ratio switch is located on the Compaq ProLiant 1600 processor board. Table 4-4 gives the Compaq ProLiant 1600 processor board bus/core ratio settings.

Table 4-4
SW1 - Bus/Core Ratio Settings

Processor Speed (Bus at 100 MHz)	1	2	3	4
300	ON	ON	OFF	ON
350	ON	ON	OFF	OFF
400	ON	OFF	ON	ON
450	ON	OFF	ON	OFF
500	ON	OFF	OFF	ON

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System I/O Board

Components

Figure 4-4 depicts the Compaq ProLiant 1600 system I/O board components. Table 4-5 gives the corresponding component descriptions.

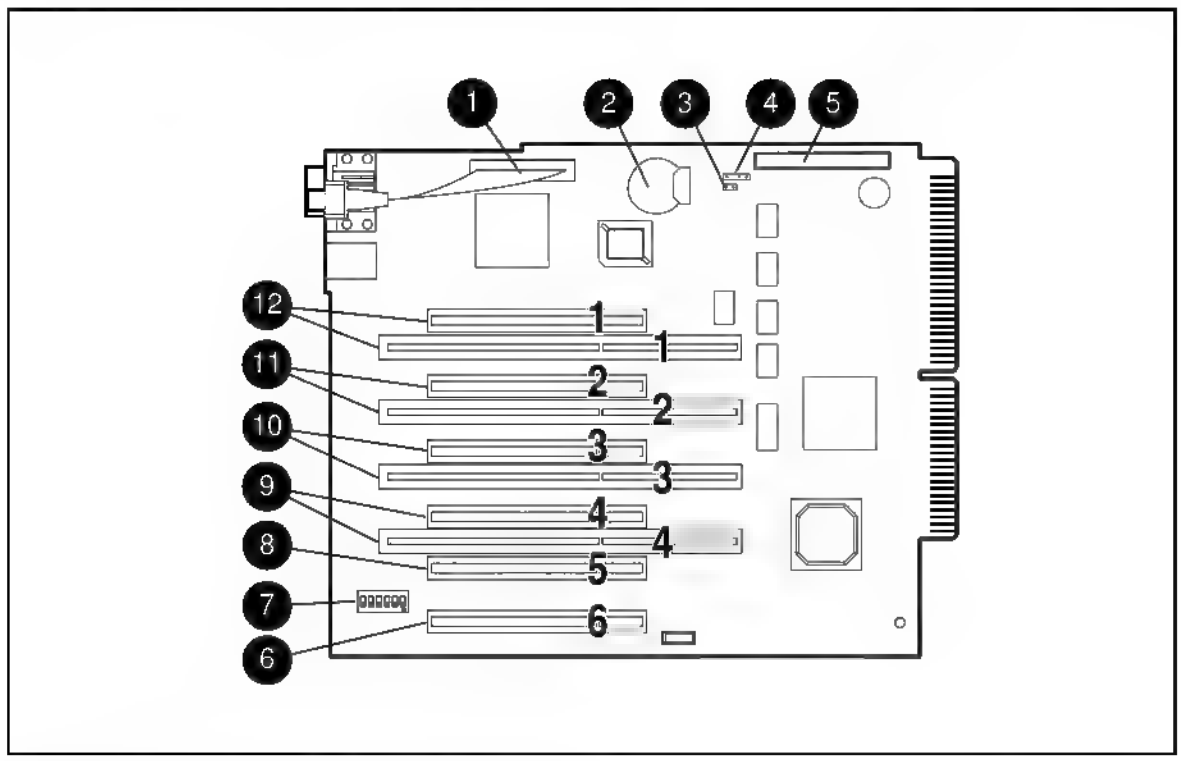

Figure 4-4. System I/O board components

Table 4-5
System I/O Board Components

Reference	Component
1	Parallel Adapter Cable
2	System Battery
3	Reserved
4	Replacement Battery Connector
5	I_2O Connector
6	PCI Expansion Slot
7	SW1 Configuration Switch
8	PCI Expansion Slot
9-<	PCI/ISA Expansion Slots

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Rear Connectors

Figure 4-5 depicts the Compaq ProLiant 1600 system I/O board rear connectors. Table 4-6 gives the corresponding connector descriptions.

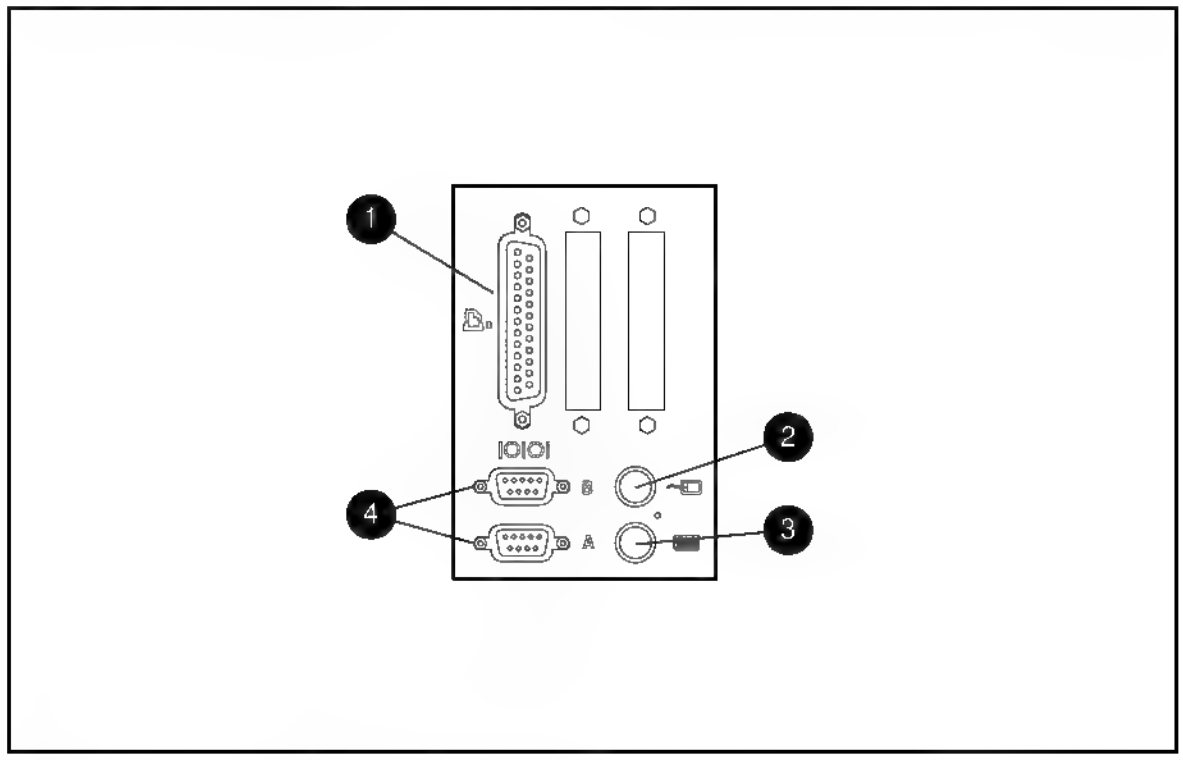

Figure 4-5. System I/O board rear connectors

Table 4-6
System I/O Board Rear Connectors

Reference	Component
1	Parallel connector
2	Mouse connector
3	Keyboard connector
4	Serial A and B connectors

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SW1 - System Maintenance Switch

Table 4-7 defines the function for each SW1 switch setting on the Compaq ProLiant 1600 Servers system I/O board. The default positions are indicated below. See Figure 4-4 and Table 4-5 for the location of the switch.

Table 4-7
SW1 - System Maintenance Switch Settings

Switch	Function	ON	OFF
1	Disable On-Board Video	On-board video is disabled.	*Default*
2	Lock configuration information	You cannot change configuration information.	*Default* Disabled
3	Tower-to-Rack Indication	Rack model.	*Default* *(Tower model)*
4	Disable Diskette Boot	System booting from the diskette drive is disabled.	*Default*
5	Disable Password	Clears passwords.	*Default*
6	Invalidates NVRAM	Invalidates NVRAM.	*Default*

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Backplane Board

Figure 4-6 depicts the Compaq ProLiant 1600 backplane board connectors. Table 4-8 gives the corresponding connector descriptions.

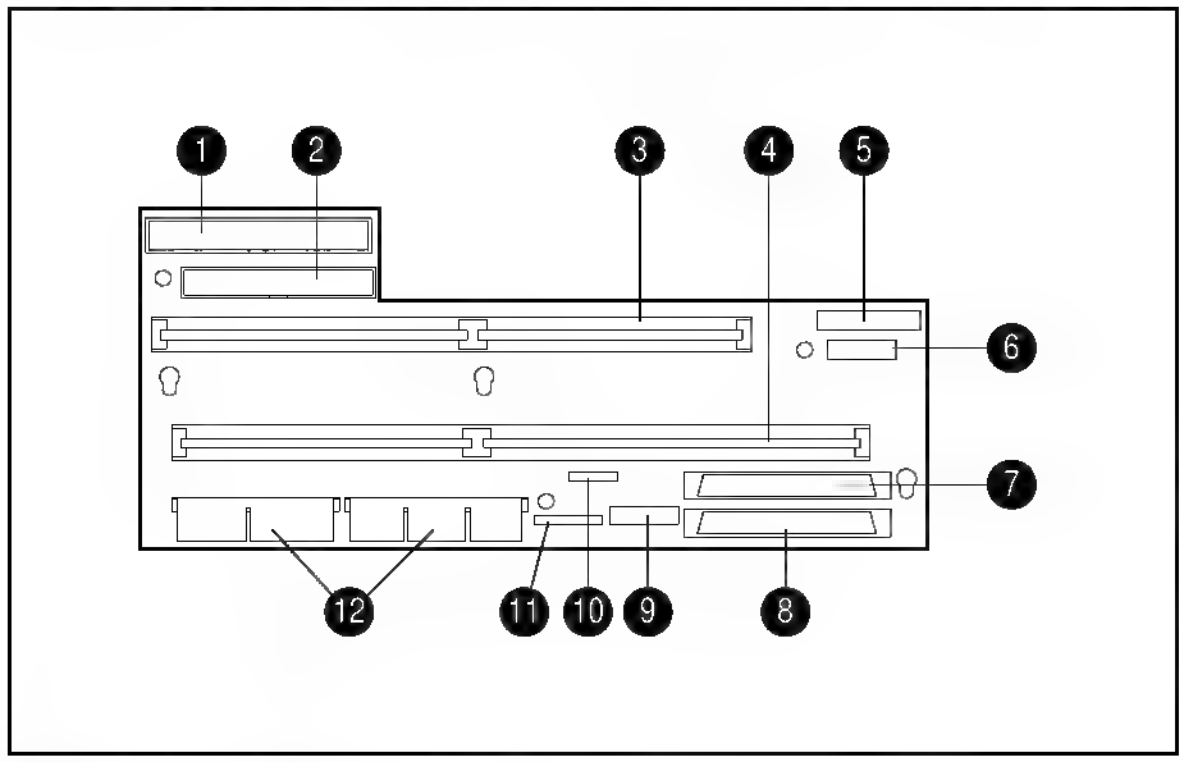

Figure 4-6. Backplane board connectors

Table 4-8
Backplane Board Connectors

Reference	Backplane Connector	Reference	Backplane Connector
1	IDE 24X CD-ROM Signal Connector	7	SCSI A Bus
2	1.44 MB Diskette Signal Connector	8	SCSI B Bus
3	System I/O Board	9	Power Supply, Small Signal Connector
4	Processor Board	:	Fan Connector
5	Integrated Management Display	;	SCSI LED Header
6	Integrated Management Display	<	Power Supplies, Power Connectors

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Chapter 5
Physical, Operating, and Performance Specifications

This section provides operating and performance specifications for Compaq ProLiant 1600 Servers Supporting Pentium II Processors with 100 MHz GTL Bus.

- System Unit
- Power Supply
- Processor
- SDRAM Dual Inline Memory Modules
- 1.44 MB Diskette Drive
- IDE 24X CD-ROM Drive
- Cables

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System Unit

Table 5-1
System Unit Specifications

	U.S.	Metric
Dimensions		
Height	18.63 in	47.32 cm
Depth	22.67 in	57.58 cm
Width	10.63 in	27 cm
Weight (no hard drive installed)	63 lb	29 kg
Input Requirements		
Rated Input Voltage	100-240 VAC	
Rated Input Frequency	50-60 Hz	
Rated Input Current	6-3 A	
Temperature Range		
Operating	50° to 95 °F	10° to 35°C
Non-operating	-22° to 122 °F	-30° to 50°C
Relative Humidity (noncondensing)		
Operating	8% to 90%	
Nonoperating	5% to 95%	
Maximum Wet Bulb Temperature	101.7 °F	38.7°C

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Power Supply

Table 5-2
Power Supply Specifications

	U.S.	Metric
Input Specifications		
Nominal Line Voltage	115 VAC	230 VAC
Range Input Line	90 VAC - 132 VAC	180 VAC - 264 VAC
Frequency Range	47Hz - 63Hz	47Hz - 63Hz
Power Factor	.98	.98
Input Current	6 A	3 A
Inrush Current	N/A	N/A
Holdup Time	20ms	20ms
General Specifications		
Full Output Rating	325 W	325 W
Minimum Load	+5V/3A	+5V/3A
Ambient Temperature Range		
Operating	41°F - 113°F	5°C- 45°C
Storage	-40°F - 185°F	-40° - 85°C

Processor

Table 5-3
Processor Specifications

Intel
Pentium II
GTL, 100 MHz Bus Speed

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SDRAM Dual Inline Memory Module (DIMM)

Table 5-4
SDRAM DIMM Specifications

Size	32, 64, 128, 256 MB
Speed	100 MHz

NOTE: Use only 32-, 64-, 128-, or 256- MB; 168-pin, 3.3 volt, 100 MHz, 72-bit wide, 4 clock, Registered SDRAM DIMMs.

1.44-MB Diskette Drive

Table 5-5
1.44-MB Diskette Drive Specifications

Size	3 1/2 in
LED Indicators (front panel)	Green
Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB
Drive Supported	One
Drive Height	One-third
Drive Rotation	300 rpm
Transfer Rate (high/low)	500K bits/sec /250K bits/sec
Bytes/Sector	512
Sectors/Track (high/low)	18/9
Tracks/Side (high/low)	80/80
Access Times:	
Track-to-Track (high/low)	3 ms/6 ms
Average (high/low)	169/94 ms
Settling Time	15 ms
Latency Average	100 ms
Cylinders (high/low)	80/80
Read/Write Heads	Two

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IDE 24X CD-ROM Drive

Table 5-6
IDE 24X CD-ROM Drive Specifications

	U.S.	Metric
Dimensions		
Height	1.68 in inserted	42.9 mm
Depth	5.85 in	150.1 mm
Width	8.11 in	208.0 mm
Weight	2.09 lb	.950 g
Data Transfer Rate		
Sustained	150 KB/s (sustained 1X), 1200 KB/s (sustained 8X)	
Burst	4.0 MB/s	
Access Times (typical)		
Full Stroke	350 ms	
Random	150 ms	
Diameter	4.7 in, 3.15 in	12 cm, 8 cm
Thickness	.05 in	1.2 mm
Track pitch	1.6 µm	
Cache/Buffer	128 KB	
Startup Time	< 7 s	
Stop Time	< 4 s (single); <30 s (multi-session)	
Laser Parameters		
Type	Semiconductor Laser GaA1As	
Wave Length	790 +/- 25 nm	
Divergence Angle	53.5° +/- 1.5°	

Continued

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IDE 24X CD-ROM Drive Specifications *Continued*

	U.S.	Metric
Output Power	0.14 mW	
Operating Conditions		
Temperature	41° to 113°F	5° to 45°C
Humidity	10% to 80%	5% to 90%
Applicable Disk	CD-ROM (Mode 1 and 2) CD-DA, CD-XA; Photo CD (single and multi-session) Mixed Mode (audio and data combined)	
Capacity	540 MB (Mode 1, 12 cm) 630 MB (Mode 2, 12 cm) 180 MB (8 cm)	
Block Size	2048 bytes (Mode 1) 2340, 2336, bytes (Mode 2) 2352 bytes (CD-DA) 2328 bytes (CD-XA)	

Diskette Cable

Table 5-7
Diskette Cable Specifications

Connector type	Flat cable, socket, multi-contact strain relief
Cable type	34 conduit flat cable
Length	9.5 in
Socket type	34 position

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IDE/CD Cable

Table 5-8
IDE/CD Cable Specifications

Connector type	Flat cable, socket, multi-contact strain relief
Cable type	40 conduit flat cable
Socket type	40 position (missing pin 28)
Length	9 in

Point-to-Point SCSI Cable

Table 5-9
Point-to-Point SCSI Cable Specifications

Connector type	Wide SCSI
Cable type	68 conduit flat cable
Socket type	68 position wide SCSI
Length	27 in

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Inde
x

A

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